OCTOBER, 1947

Industrial FINISHING

Published Monthly in the Interest of Product Cleaning and Painting by Practical Publications, Inc., 1142 N. Meridian Street, Indianapolis 4, Ind.

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slip and landed in New York's East River. After fishing the piano out of the
the shippers returned it to the Steinway plant for inspection. Though its ivory
and metal parts were sadly in need of replacement, Steinway technic
were more than pleased to find that the wood case, protected
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TWENTY-THIRD YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor P. C. BARDIN, Associate Editor

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Get the Gun with "HOLLOW AIR"

Short Movies at Factory. The entertainment motion picture program which proved so successful in bettering employee relations during the war has been revived by United World Films, Inc., 445 Park Ave., New York, N. Y.

United World experts have tailored film programs to fit industrial users. These ½-hour programs of selected short subjects include sport films, cartoons, travelogues, news reels and musicals, many of them late Hollywood releases. Chosen for their high audience interest, these programs contain no propaganda or training films.

A new rental system, recently developed, keeps costs at a very low figure. Moreover, films don't take away from working time as they are meant to be shown during lunch hour and rest periods. Workers find them a tonic to lick boredom, relieve job monotony and banish noonday fatigue.

* * *

More Trained Men Needed. Industrial concerns are short of technically trained men today, and competition for these men is keener than it ever was, according to H. N. Muller, manager of the educational department for the Westinghouse Electric Corp. Engineering colleges report a 100% increase in the number of companies now interviewing their graduates, in comparison to prewar years.

This latest manpower shortage, Mr. Muller predicted, will last well into 1949 or 1950. It stems directly from industrial expansion, coupled with the relatively few engineers and scientists graduated from colleges during the war. Westinghouse alone is now recruiting from the colleges over 100 more men each year than before the war.

* * *

Aluminum for Autos. While setting its sights for turning out 1,500 automobiles a day by early spring, Kaiser-Frazer Corp. states that a new aluminum utility sheet, developed by Kaiser's Permanente Metals Corp., will be used for various stampings to replace steel in its automobiles. "Permanente" is enabling aluminum to replace steel in a wide range of uses, and is immediately available. At Willow Run it will be put to use first for gasoline tanks in Kaiser and Frazer automobiles.

Airplane manufacturers have been using aluminum gasoline tanks for years. The new aluminum utility sheet stamps out and fabricates very successfully.

Kaiser-Frazer's new seam-welded aluminum gasoline tanks weigh only 7-lbs. per tank, yet they have a capacity of 21 gallons. The steel tanks weigh 22-lbs.

* * *

U. S. Clocks to Swiss. The Minneapolis-Honeywell Regulator Co. has sold a number of its American-made clocks to, of all people, the Swiss. The sales included Chronotherms, Honeywell's new clock

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thermostat developed to automatically lower house temperatures during sleeping hours. The thrifty Swiss are fuel conscious and welcomed the new instruments to help save on fuel bills.

* * *

Paints for Masonry Walls. The extensive use of masonry building materials, for which decorative or water-repellent treatment is desirable, has increased the need for more complete information regarding the durability of coatings for masonry surfaces. To provide comprehensive data on the large number of paints in the masonry group, exposure tests extending over a 6-year period were made on a number of commercial masonry paints by paint chemists for the National Bureau of Standards. Results of this investigation have provided much-needed information. For complete data on this, write the National Bureau of Standards, Washington 25, D. C. for Technical Report 1115.

* * *

An Industrial Salesman. A salesman today is at least 12 men. He is: 1) An organizer—to plan and program his work systematically; 2) An artist—to sketch pictures and stimulate interest; 3) A teacher—to impart information in a clear vivid understandable manner; 4) A scientist—to analyze human moods, solve buyers' problems, demonstrate values; 5) A personnel man—to awaken inspiration and guide human motives; 6) A persuader—to bring purpose and conviction out of opposing viewpoints; 7) An executive—to make decisions for others and assist them in making decisions for themselves; 8) A diplomat—to iron out knotty problems, remove obstacles, reconcile objections, bring about favorable

agreement; 9) A dispatcher—to induce action and carry out decisions of the executive; 10) A counsellor —to maintain service relations and promote goodwill; 11) a showman —to gain the attention of the uncooperative and hold it in spite of them, and 12) A hero—to keep going when it seems there is no sense in taking another step. A salesman is all these things, plus being, first of all, a man.

* * *

Why So Many Fires? Some experts say that thoughtlessness is responsible for America having the highest fire rate in the world—for example, people who see a burning cigarette on a path in the woods leave it for someone else to put out; workers who fail to report a smoking motor because "it's not their job"; housewives who fail to replace a frayed electric cord because a bridge date is more important; farmers who fail to report a brush fire because it is too far off to damage their property. These are the people who will cause 1,700,000 fires this year which will kill 11,000 other Americans—and perhaps themselves.

Ignorance and indifference to fire control can be removed by the strong light of education, just as the clean rays of the sun eradicates germs. It is a matter of statistical record that 90% of all fires are preventable.

* * *

Stainless Steel Paint. Using stainless steel powder as a base and either spar varnish or lacquer as the vehicle produces a coating material which protects the surface to which it is applied against acids and chemicals. It is said to be highly resistant to the fumes of

(Continued on page 131)

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FILMITE
THE QUICK, EASY, COST-SAVING WAY TO PEEL OVER-SPRAY FROM PAINT BOOTHS.
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AHON

Finishes for INSIDES AND OUTSIDES OF METAL Containers

By J. H. McKENZIE
Manager of Enameling & Decorating Division of American Can Co.

An authoritative article about the requirements for, tests on, and methods of applying durable coatings for interiors and exteriors of all-metal containers in which are packed food, drink and many other semi-solid and liquid products.

PROTECTIVE and decorative finishes have greatly broadened the usefulness of metal containers and have paved the way for increased use of electrolytic tin plate. The formulation and evaluation of these finishes, plus the "know how" of coating application, have therefore become very important parts of modern can making.

The first can enamels were used for red fruits such as cherries and raspberries to prevent the bleaching effect of plain metal on product color. Enamels were next developed to prevent metal blackening in cans holding sulphur-bearing products, such as meat, fish and corn. Beer can enamels were developed to preserve quality through retention of flavor and clarity.

Requirements of Finishes That Coat Insides of Containers

The wide variety of commodities packaged in 5-gallon steel drums calls for a number of special coatings to protect the steel from corrosion and to resist chemical action of the product. More resistant coatings are required, for example, for lacquers, lacquer thinners and water-base paints than for ordinary house paints and enamels.

Generally speaking, the qualifications for a good interior food container coating are that it be non-toxic and taste-free; it must not soften, disintegrate or lose adhesion when exposed to processing temperatures; must resist the chemical action of food acids and essential oils; must bake out in a

few minutes time to a continuous, thin, abrasion resistant film, possessing sufficient flexibility and adhesion to withstand high speed metal stamping and forming operations.

These general specifications must also be met by interior enamels for industrial products, except that taste characteristics and resistance to thermal processing are not important. In addition, resistance to solvents, alkalis and a host of other chemical products must be considered.

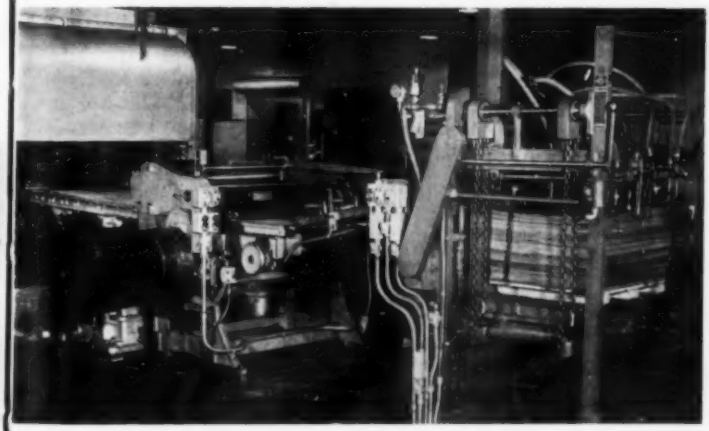
While not in contact with the container contents, exterior coatings must nevertheless resist thermal processing, discoloration and disintegration from outdoor exposure, sunlight, solvents, and fumes. They must meet a number of special requirements associated with the packing procedures employed, storage and ultimate consumer use. Exterior finishes include the whites, varnishes and gold-colored enamels used to protect as well as decorate containers for greater "eye appeal" in the retail store.

Coatings are Applied by Rollers or Spraying

Most enamels are applied by a roller coating machine to the flat sheets of metal before the sheets are formed into can parts. The exceptions are drums, five-gallon steel containers and beer cans, where some parts of the container are sprayed. Particular attention must be paid to film continuity, thickness and baking cycle.

The enamel is picked up from a reservoir or fountain by means of steel transfer rolls and thence transferred to a glue-glycerin composition or rubber roller. The metal sheets contact the latter in passing through the machine to the oven where they are baked at temperatures ranging from 250° to 450° F. for five to 20 minutes depending upon the curing cycle required.

(To page 38)



View in one of the American Can Co's. factories, showing a roller coating machine with an automatic feeder (at right) and drying oven (at left).

Film thickness is controlled by micrometer adjustments of the steel rollers. It varies from .00005 to .0005 inches, depending on type and end use of the particular coating. Where can-bodies are to be soldered, a plain tin margin must be left on the coated sheets. To accomplish this, appropriate sections [usually grooves around the roller] are cut out of the composition rollers so that no coating is applied at these points. After the stock is enameled it must be carefully handled through all manufacturing sequences to avoid scratches and exposure of bare metal.

Accelerated Tests for Evaluating Can Finishes

Few short cuts or accelerated tests have proved completely satisfactory in evaluating metal container finishes. While preliminary evaluation with representative products provides a general picture of enamel performance, it will be noted in the following outline of methods used that each product and condition must, in the final analysis, be considered by itself.

A new material to be investigated, for either interior or exterior use, is first subjected to a routine check of physical properties to determine the following: gallon weight, percent solids; viscosity; solvents employed; percent thinner required for reduction to coating or spraying viscosity; coating and fabricating characteristics; applied cost; storage stability, and gas checking. The laboratory methods used for determining most of the physical constants vary little from accepted standards in the paint industry.

If the new material successfully passes these tests, it is then subjected to a more detailed and critical scrutiny in a number of specialized tests to ascertain its relative merits for specific products and uses.

The only satisfactory and sure way to determine resistance to thermal processing is to pack products representative of certain classes of foods in cans enameled with the test material. Since the breakdown of an enamel film is a slow process which takes place during processing and storage, tests of this nature usually extend over a period of months and even years before results are considered conclusive, although the cans are sometimes stored at 100° F. to accelerate enamel breakdown.

Since the merchantability of a packer's product is so closely related to its flavor, then taste and odor are factors that must be thoroughly investigated in a new material and in subsequent routine quality control tests after adoption for commercial use. Since taste is a matter of personal preference, five to ten experienced people are employed to make these tests. Representative samples of packed enamel lined cans are graded by them for any off-flavor which may have developed.

Interior Coating Must Not Harm Contents of Can

Naturally it is important that enamels for the interior of food cans be free from any material that might be considered a public health hazard. Lead driers or pigments, for example, must not be used.

Certain packaging conditions and quality considerations necessitate the use of special procedures. For example, the essential oil vapors from some spices readily soften most finishes. Humid storage conditions greatly accelerate this type of breakdown, hence coatings for the interior and exterior of spice cans

there's more to a finish than meets the eye

Besides eye-catching beauty, a finish should make a bid for consumer acceptance by providing long-lasting surface protection. Good reasons why you should check over the advantages of preparing your surfaces with Oakite CrysCoat. That way you can minimize finish failures caused by improper adhesion, flaking or rusting.

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Removing light shop oils, and inhibiting rust, the Oakite CrysCoat Process properly prepares surfaces for long-lasting finishes by laying down a highly receptive crystalline phosphate film in which your finish virtually takes root. For full application details sure to lower pre-finishing costs and minimize costly rejects, ask the Oakite Technical Service Representative about the

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MATERIALS
METHODS
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Specialized Industrial Cleaning

must pass an accelerated test consisting of exposure to spice fumes at high temperatures and humidity for 60 to 90 days.

Interior Coatings for Non-Food Containers

Interior coatings for non-food containers are subjected to the chemical action of a variety of products, each of which must be considered individually. While each new product requires testing, from its chemical composition and past experience with similar materials, predictions can often be made which will save considerable research time and money. For example, certain types of enamel films are known to disintegrate rapidly in the presence of alkaline products, and therefore cannot be considered for such products as animal glues, casein water paints, liquid soaps and similar commodities with a pH above 7.

A rather general and rapid evaluation of the characteristics of any new enamel may be made by applying it to the various types of plate and packing panels in a number of products representative of certain classes of commodities. It is, of course, important that the test panels be subjected to drawing operations closely related to those employed on the container commonly used for the product in question. Many manufacturers of industrial finishes are misled as to the relative merits of their products for can-making operations because their tests are carried out on sprayed panels with an extra heavy film thickness applied.

A new enamel must finally be checked through its use in semi-commercial packs. Unless this precaution is taken, unexpected and sometimes disastrous results develop because of varying product formulations.

As tin restrictions are relaxed, the essential need for exterior coatings for protective purposes will diminish, particularly on higher grades of electrolytic tin plate. Competition, on the other hand, will increase the need for colorful finishes to enhance sales appeal.

Exterior Coatings and Lithograph Inks

Thermally processed food cans are subjected to a wide variety of conditions which tend to soften, blister, discolor or disintegrate outside enamels and lithography. Boiling water processes commonly used for acid fruits and juices tend to cause loss of adhesion, minute pin blisters and "blushing" of the enamel film. Enamels for this purpose must, therefore, be tested under commercial processing conditions and graded for each of these characteristics. They also should not soften under heat and, thereby be easily marred during handling in the packer's plant. In the case of citrus products, resistance to hot citrus juices often spilled on the outside of the cans in filling is important.

Meats, fish and vegetables receive a higher process ranging from 25 minutes to three hours at 240° to 250° F. In addition, many packers use dilute alkali washes or solvents to remove the residual grease and oils from meat and fish packing procedures. For these higher processed products, exterior finishes and inks must obviously be more resistant. Finishing varnishes applied over these printed designs must also retain their original gloss and color as well as resist the softening action of steam and heat.

Like thermal processed food containers, the exterior finishes on cans for industrial products are for both decorative and protective

—available now in

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Successfully used for many years in cleaning operations in the metal finishing field, DU-LITE's No. 29 CLEANER has now been activated by the addition of "TITRONNE," Du-Lite's remarkable new wetting agent.

DU-LITE's No. 29 CLEANER is so improved in its detergent and water depressant properties that a brief soak will quickly route and dissipate soil and heavy greases from iron, steel and brass parts. It will quickly penetrate the "hard-to-get-at" places created by seams, blind holes and zigzag crevices. No. 29 CLEANER is economical to use: three (3) ounces to the gallon in soak cleaning tanks—one (1) ounce to the gallon in tumbling barrels.

Price—10 cents per pound in drums of 375 lbs. (approx.)
F. O. B. Middletown, Conn. Terms—1% 10 days

TITRONNE FOR YOUR OWN USE

TITRONNE is available for general industrial uses. Non-irritating, non-toxic, Titronne can be used in soft or hard water, and in acid or alkaline solutions. A 3% concentration will reduce the surface tension of aqueous solutions by more than 50%. Titronne may be used advantegeously as an addition to metal and textile cleaners.

Price—31 cents per pound in containers of 100 lbs. (approx.)
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THE Du-Lite CHEMICAL Corporation

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purposes. The usual procedure is first to apply a coated white or pastel background which is then lithographed and finally varnished. To be acceptable, coatings must adequately cover the metal so as to produce a good appearance when applied in a thin, flexible film, and have a surface which will take lithographic inks.

Coatings, varnishes and inks must resist discoloration from repeated baking, exposure to sunlight and aging. They must also be mar resistant and non-thermoplastic. Many insecticide style containers used for such products as auto polishes, waxes and insecticides are soldered on the inside of the seam to permit lithographic decoration to extend completely around the outer surface. Coatings and varnishes for this style container must withstand this localized heating operation without discoloration.

Behr-Manning Announces Service Packaging Plan

Behr-Manning (Division of Norton Co.), Troy, N. Y., announces a new trade-built repackaging plan—Service Packaging of Coated Abrasives—effective on shipments after January, 1948.

Said to have required 2½ years of study and research into the buying, selling, handling and use habits of its distributors, dealers and consumers, the new Service Packaging program is described by Behr-Manning as "... a planned, 'tailored' method of packaging coated abrasives in such proper quantities, weights and invoice values, and in such readily identified containers and wrappers, as to best serve the functional needs and habits of our distributors, dealers and consumers alike."

The new Service Packaging plan offers economy and convenience in the buying, selling, handling and use of coated abrasives. Features include 1) new decimal quantities instead of ream and quire counts; 2) new standard master packages; 3) new component resale packages; 4) brand identification by colored labels; 5) line identification by wrapper design.

Truscon Appoints A. F. Tomes Eastern Branch Manager

Truscon Laboratories, a division of Devoe & Raynolds Co., Inc., has appointed Austin F. Tomes as Eastern Branch Manager. Mr. Tomes has been actively associated in the technical paint, waterproofing and maintenance fields for the past 20 years.

A. F. Tomes, now Eastern Branch Manager for Truscon Laboratories.

Industrial Cleaning Materials and Methods

How new products and methods in the field of industrial cleaning and allied procedures are helping to lower production costs is the theme of each of four regional technical-sales conferences being held throughout the country, from September through November, 1947 by Oakite Products, Inc.

The first conference was held September 8 to 10, inclusive, at the Palmer House, Chicago, Ill., launching a series of lectures and round-table discussions on the new materials which have emerged from the Oakite chemical laboratory during the past year. Members of the Central, Chicago and Detroit divisions of the Company participated in a resume of methods of applying the new chemical materials in industry. Special reports on food processing, metals, automotive and railway transportation, milk products were featured.

The second in the series of regional conferences was held September 15 to 17 at the Coronado Hotel in St. Louis, Mo. The third meeting was held at the Hotel Commodore in New York, Oct. 6 to 8 inclusive.

The St. Francis Hotel, San Francisco, Calif., is scheduled to be the scene of the fourth conference on November 17 and 18, in which members of the North and South Pacific Coast divisions will participate.

Remember Pearl Essence for

A Decorative Finish

MEARLMAID Pearl Essence is being used on hundreds of different products to produce a decorative and attractive effect.

Investigate the numerous advantages of a Mearlmaid Finish before you select the final coating. Its sales appeal and merchandising value are important.

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Has High Reflective Light Value

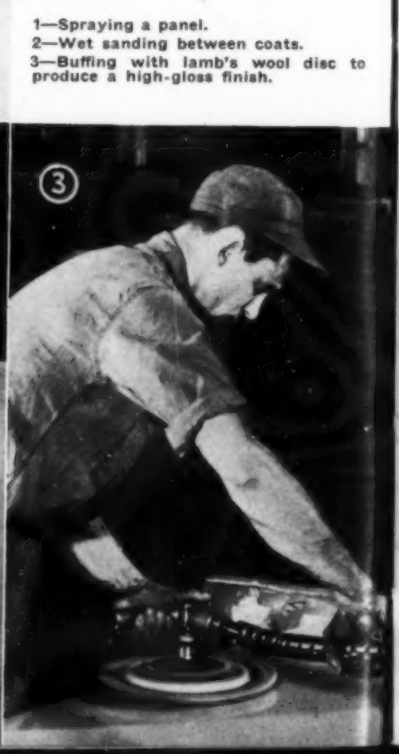
For Dials Controls Instruments

"WORLD'S LARGEST PRODUCER OF PEARL ESSENCE"

FINISHING

SUPPLIED in 61 colors and flat, extra-flat, semi-gloss and high-gloss finishes, Otis Elevator Co. cab interiors must retain their original tonal values and degrees of reflectiveness for many years. The surfaces must be hard, yet tough and flexible to stand service and abuse without becoming marred, chipped or cracked.

1—Spraying a panel.
2—Wet sanding between coats.
3—Buffing with lamb's wool disc to produce a high-gloss finish.



Otis ELEVATOR CABS

A few glimpses into the finishing department at its plant in Harrison, N. J., are shown in the accompanying pictures.

In preparation for receiving and holding their protective and decorative coatings, elevator panels are Bonderized to protect the steel from rust and to provide better anchorage for the paint. Following the sprayed prime coat and the intermediate color coats, the panels are wet sanded as shown in one of the accompanying pictures. This wet sanding smooths the coated panels and, as a result, the final top coat is applied to a uniformly smooth and level surface.

Otis has four standard finishes for cab interiors, as follows:

A) A flat finish which is recommended for canopies of cabs with direct lighting.

AA) An extra-flat finish for use on canopies of cabs with indirect lighting. *(Continued on page 48)*

Here workmen are hoisting cab panels from the Bonderizing tank.

B) A semi-gloss finish for cab panels and other lacquered parts, except canopies.

C) A high-gloss finish for cab panels and other lacquered parts, except canopies.

The semi-gloss "B" finish is the base for all finishes. "B" is produced by the application of three coats of lacquer pigmented to the desired color.

For the flat finish "A", Otis adds one coat of flat to the "B" finish; for "AA", one coat of very flat is added to the "B" finish; for "C" the company adds three coats of clear lacquer to the "B" finish.

The final coat of clear lacquer on a typical cab door is buffed to produce a high-gloss finish, as shown in one of the pictures in this article. The polishing face is a power driven disc covered with lamb's wool.

Otis colors are divided into four classes: 1) solids; 2) Metalusters having a metallic sheen; 3) Metaluster hammertones which provide a metallic sheen and an appearance of depth created by a pitted undercoat; and 4) wood grain reproductions of fine hardwoods and veneers.

Pyroxylin lacquers, introduced by Otis in 1925 as a finish for elevator cabs, are used with all color groups except the Metaluster hammertones. In these, synthetic lacquer is used for undercoating, as pyroxylin dries to quickly to permit creation of the pitted or hammered effects.

Detects Glue Spots Before Finishing

By Frank Stover

IF YOU were to call on executives in furniture and cabinet plants and offer to show them a simple way of detecting and removing all excessive glue from the exposed surfaces of assembled products entering their finishing rooms, probably 95% of them would tell you that their finishing rooms weren't having any trouble with glue spots; and from their seats in the office they would be telling you what they believed to be true, but is it? Do they know how much of the firm's money is being paid to men just to look for and remove excessive glue? Do they know that it costs anywhere from a dime to a dollar to remove a glue spot in the finishing room?

Glue spots are not easy to see in the cabinet room and on some woods they are almost impossible to detect. But when stain or filler is applied, up jumps the devil. The cost of removing a glue spot is very small once it is found, but the time spent finding it is a costly item.

Cabinet makers or cabinet cleaners spend considerable time just looking for glue which should be removed before finishing. Sometimes they find it all and sometimes they don't.

Most finishing foremen look at glue spots as part of their routine finishing job. They have had glue spots to remove or hide as long as they can remember. They know how hard these places are to find but they go along saying nothing to anyone about this menace. But they would certainly be happy to have every item come into the finishing room free of all glue spots. In the past, our cabinet cleaners did the best they, or any other group of men, could do to find and remove excessive glue before the

"FINISHES"... *by Stanley*

Compact cases, lipstick shells . . . why do they have so much sales appeal on the counter, so much charm on the dressing table?

One answer, of course, is colorful enamels and special lacquers that Stanley chemists have formulated for these fast selling products . . . finishes that retain their color and luster for the life of the product, that won't chip or scratch or peel.

Hundreds of metal, rubber, plastic, and textile products have benefited from Stanley's policy of "special finishes for special applications." Our research staff and unexcelled facilities are always at the service of industry . . . are *yours* for the asking.

Why not let us help you with your special finishing problems? Write to Stanley Chemical Company, East Berlin, Connecticut.

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LACQUERS SYNTHETICS JAPANS ENAMELS

cabinet went to our finishing room. Realizing the time these men had to spend every day on this one job, and with the shortage of skilled labor today, we tackled the glue spot problem.

After months of research, and with the aid of a nationally known manufacturer of finishing materials, we worked out a process known as, "The Detection of Vagrant Adhesives." Any person, skilled or unskilled, with average eyesight, can see and remove all glue spots from our cabinets. The time spent hunting the elusive glue spot is a thing of the past.

This is accomplished by adding a very inexpensive solution known as Neon-X to water which, in turn, is used when the hot glue is cooked —and, during the day when water must be added to the operators' glue pots, water containing Neon-X is used again. A small amount of Neon-X, added to cold glue, will also do the trick.

The Neon-X solution has no harmful effect on water-soluble glue. Hundreds of tests have been made here in our plant, as well as tests made by several glue companies, all of which proved satisfactory.

After the cabinet is assembled with glue containing Neon-X, it is passed before a near-violet ray lamp (not violet ray). Any glue exposed to this lamp will be illuminated like a neon sign, making it practically impossible for a workman to overlook the tiniest speck of glue.

At the present time we have one man who removes all excessive glue from 40 console cabinets an hour. This process is also used to inspect cabinets for construction. Any glue block, corner block or cleat that lacks the proper amount of glue is easily detected. It also emphasizes the excessive or wasteful use of glue. So far this year, we estimate that our savings in labor alone in the finishing room will be well over $10,000, plus a substantial increase in production.

National Metal Exposition

Slightly more than 90% of the 240,000-sq. ft. of available floor space in Chicago's International Amphitheater have been reserved for the coming National Metal Exposition, October 18th to 24th, 1947.

According to W. H. Eisenman, managing director of the Exposition and secretary of the American Society for Metals, 277 industrial exhibitors have been assigned space in the industry's largest annual exposition.

The National Metals Exposition, sponsored by the American Society for Metals, will be held concurrently with the National Metals Congress.

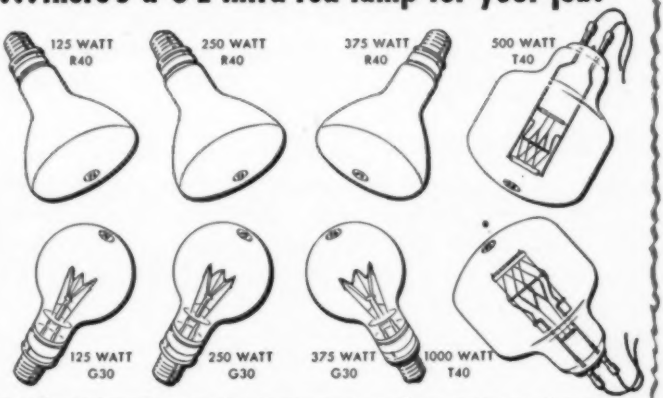
Jones-Dabney Appoints J. C. Knochel

The Jones-Dabney Co., Louisville, Ky., Division of Devoe & Raynolds Co., Inc., announces the appointment of Mr. J. C. (Cliff) Knochel as Sales Manager of the Resin & Grinding Liquids Division. Mr. Knochel is well known among paint manufacturers, especially in the midwest. He has a B. S. degree in chemical engineering and was employed for several years in the pigment division of a large company.

Cliff Knochel, Sales Manager of the Resin & Grinding Liquids Division of Jones-Dabney Co.

Whether you want to dehydrate cod fish, dry a finish, bake ceramics, cure hides . . . or what have you . . .

. . . there's a G-E infra-red lamp for your job!



Quick heat at low cost. That's what you get with General Electric industrial infra-red lamps and that's why they're being used successfully for so many jobs throughout industry. Preheating metals, thermo-setting cement, accelerating chemical reactions, drying plywood — to name just a few.

Infra-red is inherently your most flexible source of radiant energy for industrial processes. Efficient ovens can be designed to fit any production scheme. And now the wider selection of types and sizes available in G-E infra-red lamps makes it even easier to select the *right* oven for *your* job.

Remember, whatever infra-red lamps you need, General Electric makes 'em all! The full line includes sizes from 125 to 1000 watts, in both reflector and clear bulb types. For full information, consult a recognized infra-red oven manufacturer, or call your nearby G-E Lamp office. General Electric, Lamp Dept., Nela Park, Cleveland 12, Ohio.

G-E LAMPS
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PRODUCTION

Painting and Baking of

Finishing foreman of the Dura Division Detroit Harvester Co., explains how new automobile parts are spray painted and baked on a fast production basis in a minimum area of factory space.

View in finishing room; conveyor at left; infra-red drier in background; three spray booths right ahead. Notice how parts are racked for spraying and drying.

Automobile Parts

MENTION product finishing and whoever you talk to will probably think of an elaborate system, with a maze of conveyors and accessories which need a great deal of factory space, but this is not necessarily a true picture in all cases. *Simplicity is the keynote of our finishing room* where decorative finishes are applied. The entire system occupies a room 65x36-ft. Of course, this does not include metal cleaning units nor dip tanks and oven (on roof of plant) for black japan finishing of concealed and chassis part of passenger automobiles and trucks.

Chromium knobs are sprayed with color, wiped to leave color in markings

Typical window crank and door handle —parts which go through our setup

I shall endeavor to show how, during every 24 hours, we finish several thousand each of double escutcheon plates, handles for adjusting passenger car windows, handles for truck doors, inside door buttons and dome light reflectors.

Our equipment includes a monorail conveyor 104-ft. in length. It is operated through a variable-speed drive, with carriers on 12-in. centers. We have an infra-red drying tunnel, each side of which is made up of four sections of 24 lights to the section, while the end section has 15 lights; all are 250-watt lamps. Also, we have three leg-type spray booths and a batch type oven for drying parts after cleaning and Bonderizing, and prior to finishing.

First, let us consider the double escutcheon plate and handles shown in the illustrations at the beginning of this article. These items receive

By M. J. FEHLEN

Tank 1) Alkali cleaner (2-oz. to each gallon) 180° F.	one minute
Tank 2) Cold water rinse	ten seconds
Tank 3) Bonderize (12-oz. to each gallon)	two minutes
Tank 4) Hot water rinse 180° to 212° F.	ten seconds
Tank 5) Chromic Acid (½-oz. to each gallon) 160° F.	ten seconds
Oven dry at 250° F.	twenty minutes

Table I—Cleaning, rinsing, Bonderizing, rinsing and drying schedule.

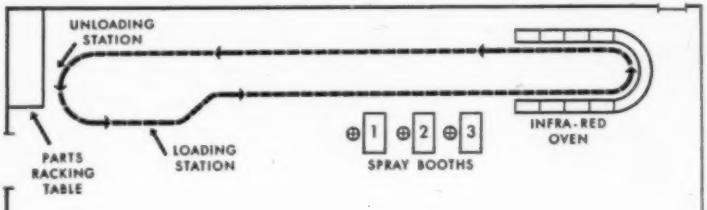
the same type of finish. They are placed in wire baskets and dipped in a series of tanks according to the following schedule shown in Table I.

Upon removal from the drying oven, baskets of parts are banked at the loading station where they cool before being placed on racks which are hung on the conveyor. Traveling at a speed of about 2-ft. a minute the work proceeds to booth No. 1 (See floor plan layout) where a spray coat of synthetic base primer is applied. The racked parts are again placed on the conveyor which carries them through the infra-red tunnel for a 14-minute bake at 350° F.

Traveling at comparatively slow speed the primed parts are sufficiently cool by the time they get around to booth No. 2 to receive a spray coat of synthetic enamel. They are returned to the conveyor and a 3-minute flow out time elapses before they reach booth No. 3 where a spray coat of clear synthetic enamel is applied. These top coats are also given a 14-minute bake at 350° F.

On the return trip, plates and handles are removed from the conveyor, and from the racks. They are inspected and loaded in paper lined trays to be delivered to the packing room.

A complete cycle is made every 51 minutes. Four productive employees operate this line. During any of their spare time, spray operators assist in unloading and racking parts. The system is operated by three shifts, and the crews are justly proud of their achievement in finishing produc-



Floor plan of our finishing room; conveyor line, spray booths and drying ovens.

BONDERIZING

...the start of the automobile's fine finish

PROTECTED BY Bonderite FOR CORROSION RESISTANCE

Before the prime coat and the sprayed and baked finish coats, comes the trip through the Bonderizing line. Here bodies, fenders, and sheet metal parts get the treatment which protects and preserves the appearance of the final finish.

This effective, fast, economical treatment is used on most cars, trucks, and buses manufactured today. Bonderizing changes the surface of metal to a non-metallic phosphate crystalline coating which is a perfect base for paint. In addition, it affords good protection from rust and corrosion, retards the spread of finish failure around accidental breaks in the paint film, promotes lasting fine appearance.

Bonderizing costs far less than its value as a product improvement and sales feature.

Investigate Bonderizing as protection for the fine finish of *your* product!

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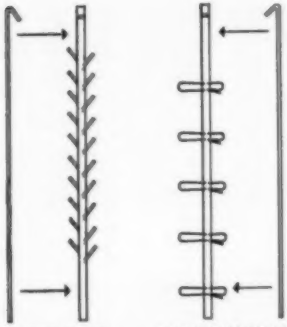


Typical conveyor racks which hold metal parts for spraying and drying.

tion. There is quite a bit of competition among the three crews.

Spray booths 4 and 5 (shown on the floor plan layout) are used for decorative finishes on such items as name plates, hood ornaments, window and door buttons and dome light reflectors. Most of the name plates, hood ornaments, cigarette lighters, door and window buttons (the latter used for hydraulic button controlled lift windows and ventilators) are finished in chromium, with color ornamentation or letters to indicate the purpose of the button.

In an illustration at the beginning of this article you will notice a metal button with a sunken letter D and a curved directional arrow. Specifications call for a red lacquer finish in the sunken letter and arrow. Because of their small size and the shallow depression, it is practically impossible to devise and use a mask which is accurate enough to protect the surrounding chromium finished top of the button, so we use an outline mask such as that shown in Fig. 4.

Buttons are mounted in an upright position on a pin board, 50 buttons to the board. The outline mask is placed over the tops of the buttons. Round holes in the mask expose the top surface of each button (to the first circle line from the center). The outline mask is made of brass 3/16-in. thick, therefore it is rigid and heavy enough to remain firmly in position when placed on top of the buttons. Red lacquer is sprayed on all button tops through the mask.

Immediately after the red lacquer is sprayed, a worker takes a cotton rag moistened with lacquer thinner, draws it tightly over his finger and wipes the red lacquer off the tops of the buttons. This treatment allows the color to remain in the recessed letter D and the curved directional arrow.

Of course, with a larger mask, it would be possible to finish more than 50 buttons at a time; but we have found that the speed of handling and placing the mask on the

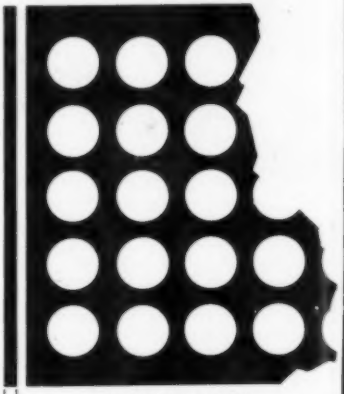
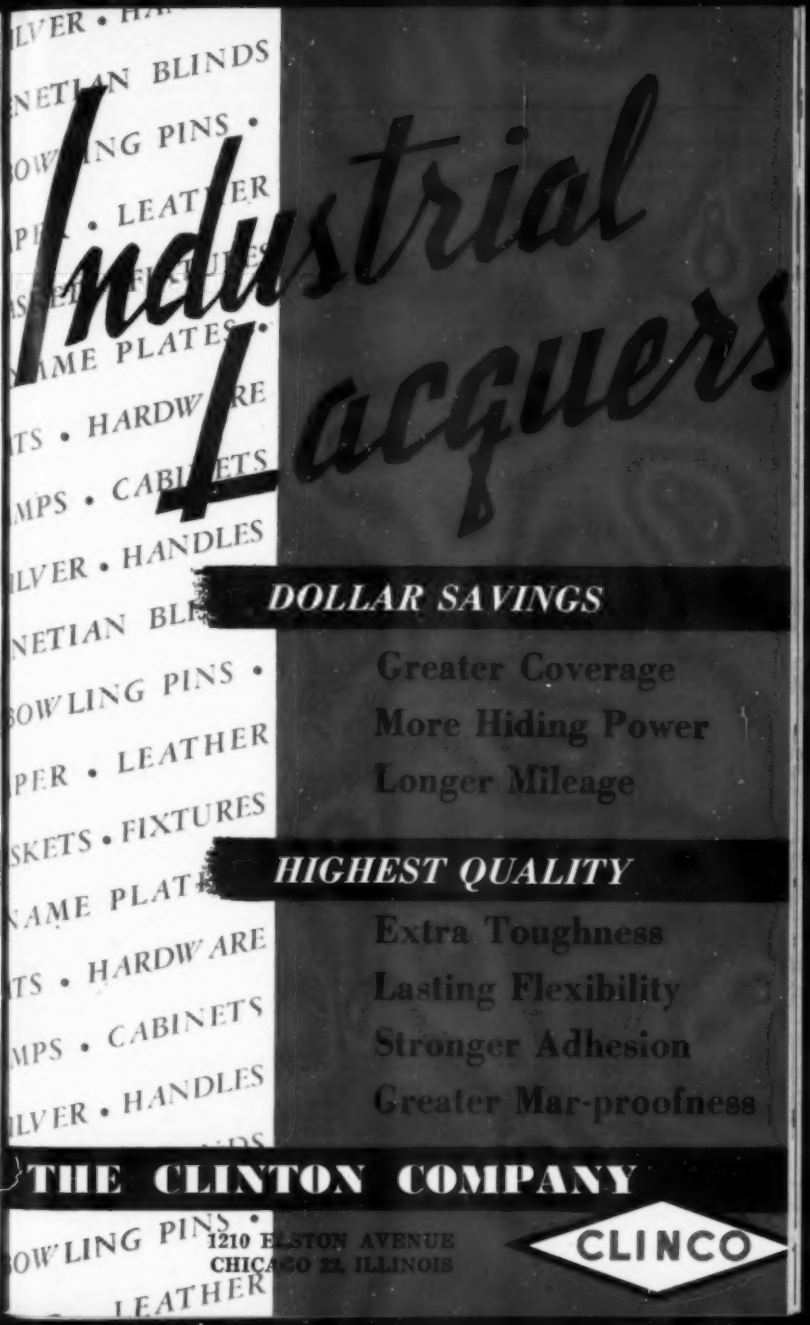


Fig. 4—Portion of heavy brass mask which is placed over tops of chromium knobs (see illustration at beginning of article), positioned on pin board. Color is then sprayed through holes in mask.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button tops, coupled with wiping before the lacquer becomes dry, is far more advantageous than if larger quantities were attempted.

Dome light reflectors are placed face up on flat boards, 100 reflectors to the board. Placing the board on a portable turntable, a spray coat of white lacquer is applied. Air drying follows.

Simplicity of the system, plus the cooperation of reliable employees of long service, combine to make quantity production possible in our relatively small finishing room.

Why the Finish Checked

By C. O'Leary

IN A RECENT issue of this magazine reference was made to checks in the finish of veneered surfaces. Some time ago I came across a checking trouble that is very rare. The finish was dark mahogany, on furniture which was partly veneered and partly solid.

When the finisher put on water stain with a brush he wet the whole cabinet, using plenty of water stain and allowing it to soak in. About an hour afterward he repeated the same operation for a second coat of stain. Naturally, some moisture worked into the joints and open pores of the wood. Then he let it stand overnight. Next morning he filled the cabinet with filler, and on the following day he sprayed the surfaces with a coat of sealer and a heavy coat of lacquer. Next day he added two more coats of the same lacquer.

After a few months the finish started to check. Checks were always with the grain. Panels checked from the joints and the solid wood checked with the grain. This checking appeared on gum, birch, mahogany and mahogany veneer.

The company had this work looked over by the lacquer firm's sales representative and chemist, and by men from five or six other companies. Most of the men seemed to think the wood contained an excessive percentage of moisture when it was finished. The boss said it was a fault of the sealer. The lacquer company blamed the wood. During all of the consultation on the problem, not one person explained the real cause, or how to avoid the trouble.

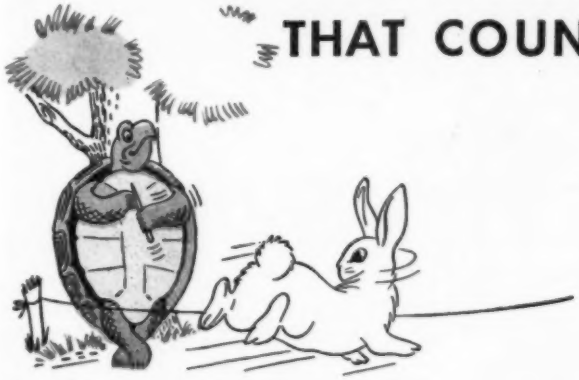
When I came in and saw the checking, I first looked to see if it was the wood or the finish. I used a jeweler's lens and saw that in the wood grain the stain was discolored. Discoloring spread along the side of the grain and it cracked the lacquer with the grain, causing the lacquer to peel.

Naturally, the cause of checking was in the water staining procedure. Water stain should be put on and wiped off at once, not allowing it to penetrate too much into the wood. I prefer using one coat of water stain and wiping it. Next day I apply a filler with stain already mixed into it. The filled surfaces are left to dry overnight. In the morning I spray on one coat of sealer, and in the late afternoon, one coat of lacquer. The following day, two coats of lacquer are sprayed on to finish the job.

At Paint and Varnish Show

New 100% phenolic resins, newly developed vinyl resins, and new coatings based on established "Bakelite" and "Vinylite" brand resins are among the many interesting developments for the coatings industry to be exhibited by Bakelite Corp., Unit of Union Carbide & Carbon Corp., at the 12th Annual Paint & Varnish Industries Show in Atlantic City, N. J., Nov. 7 to 10.

IT'S THE *FINISH* THAT COUNTS!



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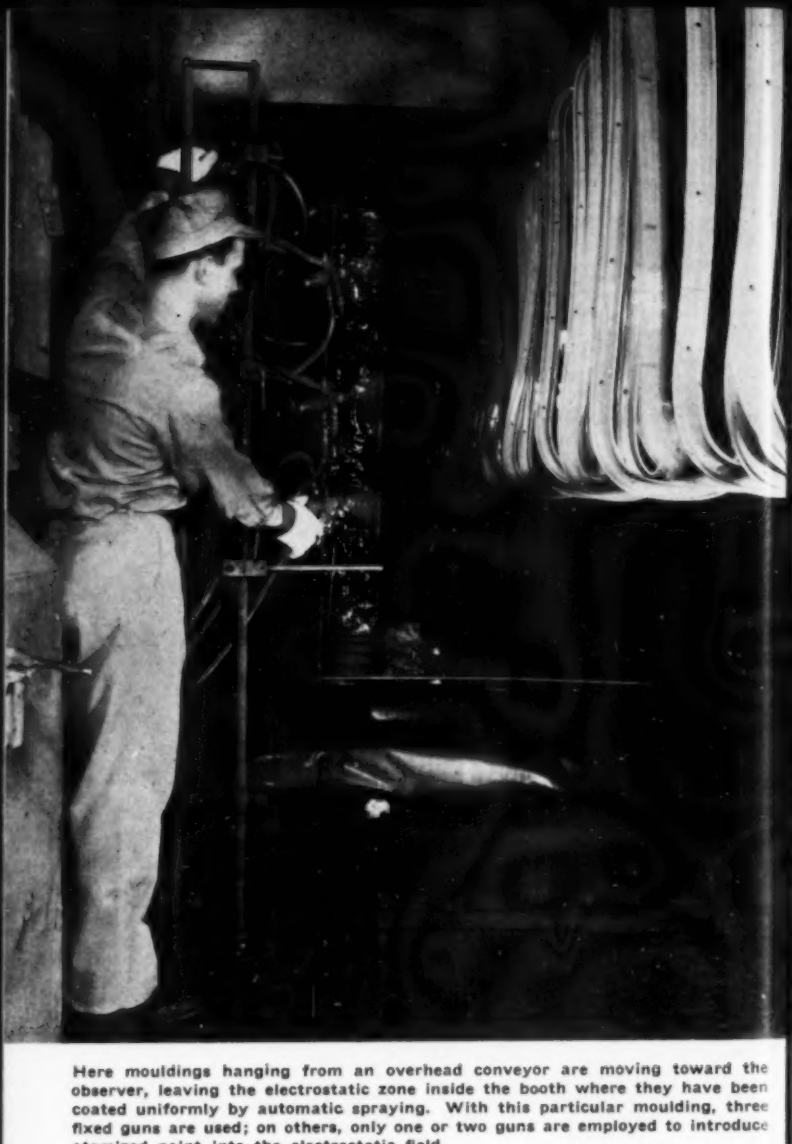


Here mouldings hanging from an overhead conveyor are moving toward the observer, leaving the electrostatic zone inside the booth where they have been coated uniformly by automatic spraying. With this particular moulding, three fixed guns are used; on others, only one or two guns are employed to introduce atomized paint into the electrostatic field.

Spray Painting AUTOMOBILE MOULDINGS

By GLENN FERDON

Plant Manager of Detroit Moulding Div'n. of L. A. Young Spring & Wire Corporation describes a new conveyorized automatic spray painting set up — in electrostatic field — for coating formed mouldings to be used inside automobiles.

THE Detroit Moulding Division has for some time used electrostatic spraying to apply ground coats on all mouldings produced in the Detroit plant. Recently the company installed another electrostatic unit to apply the finish enamel coat, so that all painting, with the exception of graining on certain mouldings, is being done in an electrostatic field.

The decision to install a second electrostatic spray unit for enamel was made on the basis of economy and quality results obtained with the ground coat unit. Savings with this automatic unit helped, to a certain extent, to offset increased production costs elsewhere. The number of mouldings that could be painted per gallon of mixed coating material was doubled, and the efficiency of the unit reduced maintenance and booth cleaning time.

The entire finishing operation at Detroit Moulding, except for graining, is conveyorized. All sizes and designs require a ground coat and are handled on the same line. Since the plant supplies finished metal mouldings to several different automobile companies, and since these mouldings include different styles of quarter lights, back lights and windows, full windows and windshield mouldings, there is a wide variety.

Conveyorized Setup Through Double-end Spray Booth

When the final forming operation is completed, mouldings are hung to an overhead conveyor, which carries them through the various finishing stages. The hooks are on 8-in. centers.

Application of the ground coat with the electrostatic process is done inside a single straight-away, double-end booth. An electrostatic coating field is in operation in each of the two booth sections. Spray guns are positioned at both ends of the booth so that some coating material is sprayed into the electrostatic field as the mouldings move away from the guns, and

some material is sprayed into the field as the mouldings move toward the guns.

All of the spray guns are on fixed standards, four guns at the incoming end, and five at the exit end of the booth. They are positioned in a pattern so that one or more can be cut in or out, depending upon the size of the pieces being painted. Only on the largest pieces (requiring relatively more coating material) are all guns set to operate at any one time. To spray quarter lights, for example, we use only one gun at each end of the booth.

In electrostatic spraying the atomized paint particles are not necessarily directed at the mouldings, but are directed roughly parallel with the line of travel. Forces in the electrostatic field pick up the atomized paint particles and "guide" them to the mouldings by a principle which will be described later. The spray guns can be fixed in permanent position. Individual constant pressure fluid regulators are provided for each gun.

Variety of Mouldings and Several Color Changes

As would be expected with the wide variety of mouldings processed, color changes are frequent during the day. Several different ground coat colors are used and the color change to any one of these can be made in less than a minute.

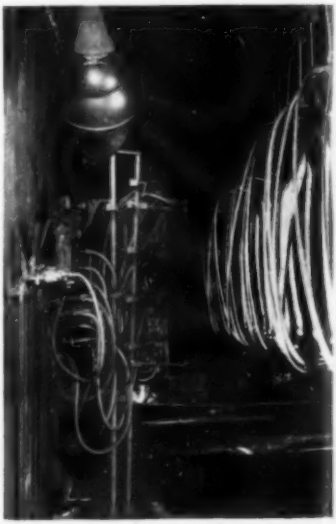
Pipe lines for each color lead into each end of the booth from paint mixing tanks. A short flexible connection is provided from this piping to a manifold which feeds the spray guns. When a color change is required, the lines are cleaned under a blow-back pressure of 75-lbs., which is about four times as much as the actual air operating pressure on the guns, and the flexible coupling is then moved to the proper color connection.

The new electrostatic line for enamel application roughly parallels this ground coating setup.

Once the ground coat is applied, one of three other finish operations occur. The moulding receives a coat of color enamel, or is hand-grained and receives a top coat of clear material.

How Electrostatic Spray Process Works

The electrostatic spray process is based on the well-known electrical principle that like charges repel, while opposites attract. Wire electrodes which may be seen faintly in the accompanying pictures, are placed inside the paint booth. The parts being painted move



At opposite end of spray booth where mouldings enter by overhead conveyor.

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through this area on a conveyor. As the atomized paint is sprayed into the area, or "coating zone", and as parts to be painted move through it, the paint becomes negatively charged through the electrostatic field set-up.

While the fine paint particles become negatively charged, the mouldings are of opposite polarity; they are grounded by the metal work-holders and conveyor. Paint particles are repelled from the electrodes, because they are both negative in charge, but they are attracted to the positive polarity of the electrically grounded metal mouldings. While the equipment is charged to high voltage intensity, the amperage is extremely low—less than 10 milliamperes at maximum—and the power consumption is less than that of a 1000-watt light bulb.

Aside from its production economies, this electrostatic method of painting assures a uniform film thickness on each moulding because the application is entirely automatic. The system also provides a perfectly smooth finish.

Wood Filler Can Be Used for Many Things

PASTE wood filler is generally used for filling the open pores in mahogany, oak, ash, and other more or less porous woods. It is usually used under clear finishes so that the topcoats will present a smooth, level appearance. Did you know that it has many more uses in the finishing department?

The end grain of wood that is to be enameled often presents a problem because both primer and enamel may sink in on such surfaces. End grain on cabinet doors and soft-wood turnings are often difficult to finish with only one or two coats of enamel. Try applying a little thick wood filler on these areas before applying the primer. You will find that primer and enamel will be held on the surface. Often an extra coat of enamel can be eliminated by this treatment.

In applying an enamel finish on open-pored woods like oak and ash it is often necessary to apply two coats of primer, with careful sanding of each coat, if the pores are not to show after the enamel is dry. Filling the wood with a paste wood filler first will eliminate the extra prime coat.

Try using paste wood filler in its original consistency as a knifing compound for filling cracks, dents, and holes in wood construction. When dry, it may be sanded smooth if necessary. A good paste filler will shrink little when used in this manner.—R. B.

Advance Paint Co. Plans Move and Expansion

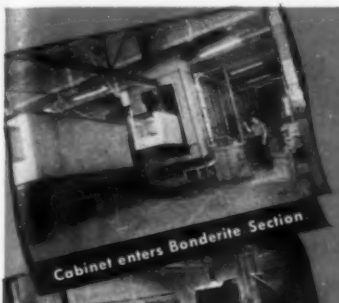
Early next year the Advance Paint Co. (all kinds of industrial finishing materials), Indianapolis, Ind., will begin moving into larger buildings at a more desirable location and will increase its production capacity six times, at a cost exceeding $1,000,000. The company has purchased a large modern type 4-story and basement building of reinforced concrete, and will erect two additional buildings each two stories in height with full basement.

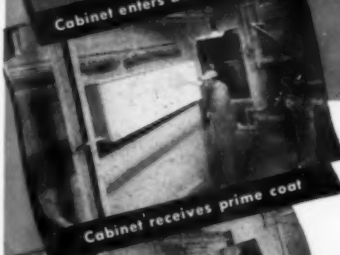
One of the new buildings will house company offices and a cafeteria on the first floor and research laboratories on the second floor.

The new varnish and synthetic resin plant will be 50x200-ft. Another building will house 27 storage tanks with a total capacity of 400,000 gallons of raw materials, which will be located partially below ground level.

The main factory is to be made as nearly fireproof as possible.

The company expects to move some manufacturing to the new location in January 1948 and to complete the move by June 1948.


Cabinet enters Bonderite Section


Cabinet receives prime coat

Cabinet leaves prime coat oven

Cabinet leaves finish coat oven

Case History of a DESPATCH Finishing System

Finishes 125 Deep-Freeze Cabinets per 8-Hour Day

When Noma Electric specified 125 *finished* deep-freezers per day, DESPATCH proposed a continuous conveyor Bonderite system with spray booths and gas-fired ovens.

These four photos give a step-by-step picture story of the DESPATCH Finishing System recently installed at Frigid Freeze Division of Noma Electric Corp., Barber, N. J.

This unit processes a cabinet in less than 4 minutes. Endless monorail conveyor carries cabinets and parts through hot alkali wash, hot water rinse, phosphate coating, cold water spray, chromic acid rinse. Work then travels through dry-off oven, prime coat spray booth and baking oven, finish coat spray booth and baking oven.

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GREATER OUTPUT. Provides maximum output per manhour . . . eliminates transfers . . . saves floor-space.

BETTER BAKING. Assured by uniform air distribution . . . 100% convection heat . . . automatic controls.

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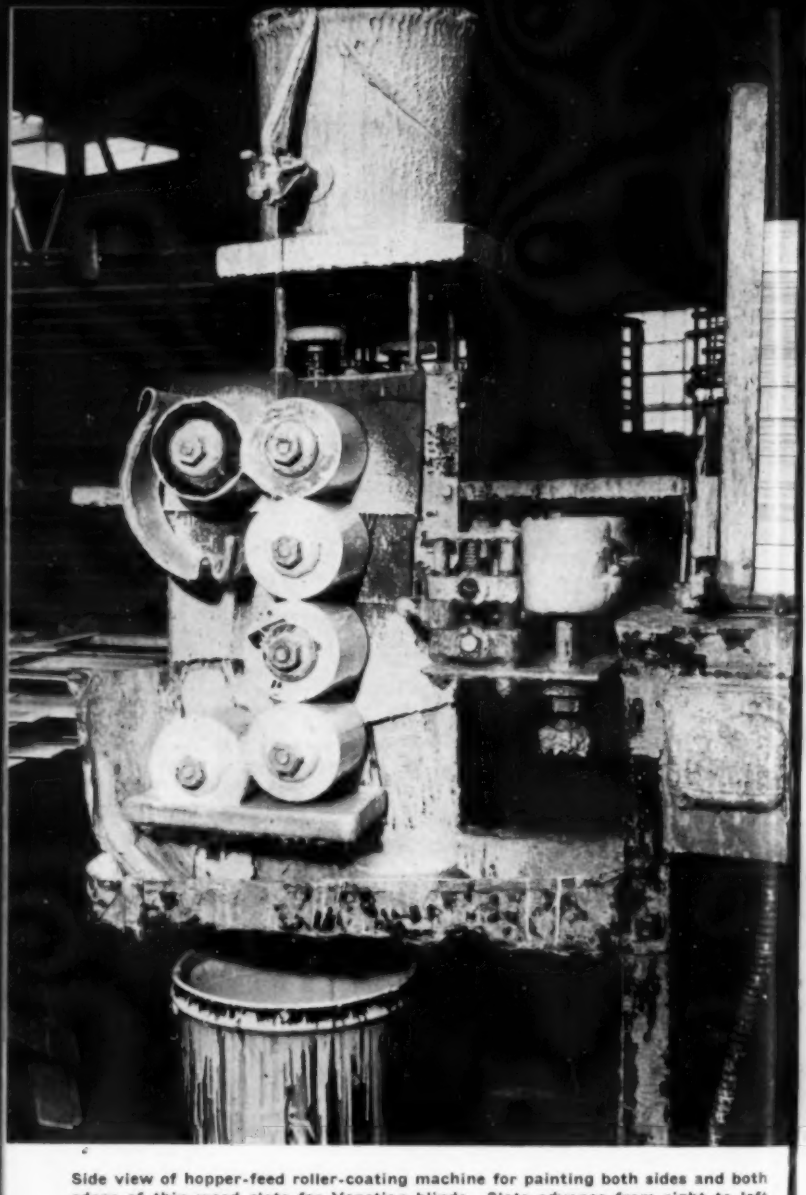


Side view of hopper-feed roller-coating machine for painting both sides and both edges of thin wood slats for Venetian blinds. Slats advance from right to left and pass between the middle rollers. Paint flow and film thickness can be controlled to suit requirements of the job. Drying racks are at outfeed end (left) and in background. These racks are especially designed and made for this work.

Roller Coating Venetian Blind Slats

General Manager of the Universal Venetian Blind Co., Chicago, tells how a portable roller coater finishes 2 sides and 2 edges of Venetian blind slats, rails and fascia boards.

By WILLIAM F. TRILK

FOR MANY YEARS roller coating machines have been used to spread finishing materials on thin flat metal sheets, composition board, straw board and paper. Coating two sides and two edges of comparatively thin materials offers no problem. The back-flow between the rollers will deposit enough liquid material to adequately coat the two edges. However, to satisfactorily coat the edges of wood strips ranging in thickness from ⅛-in. to 25/32-in., other means must be provided.

The roller coater shown in the accompanying pictures is a self contained portable unit. Its feed table has a 3-in. canvas belt operating just in front of the hopper feed. The hopper has a capacity of 250 slats ⅛-in. thick, and will accommodate various lengths from 16-in. to 12-ft. A ½-hp. explosion-proof motor drives the unit through a speed reducer (a 1 to 6 ratio).

A throw-out clutch delivers power to a metal kick plate located close to the hopper feed. With the clutch engaged, the kick plate, operating with a reciprocating action, slides forward and pushes the bottom slat from the hopper to the moving belt. The timing action of the kick plate may be adjusted for slats of varying lengths.

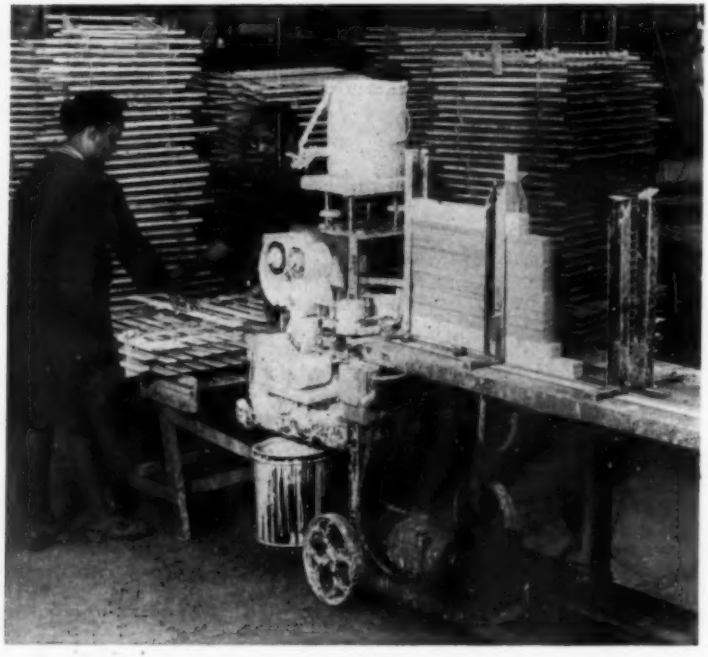
Between the first two hopper standards there is a tilt bar with two small idler rollers. Slats must pass under these rollers before they enter the machine. At the proper time the bar tilts back, raising the idler rollers sufficiently to allow a wood slat to pass under it and the rollers—and onto the moving belt. As the kick plate recedes, the tilt bar springs back into place, allowing the idler rollers to press the wood slat against the belt as the slat moves forward to the paint rolls. The need for these hold-down rollers close to the infeed end of the machine is obvious. They press each light weight slat firmly to the moving belt and guide it into correct position to pass between the edge-coating rollers. The clutch controls only the kick plate. The feed belt and all driven rollers operate continuously.

To clarify the action of the roller coater, I suggest that you refer to the accompanying diagram. A canvas feed belt carries each slat forward until its "head" end contacts the drive roller No. 2 and the idler roller No. 1. The feed belt and rollers furnish momentum to move the slat forward between the

edge-coating rollers and brushes (not shown in the drawing, but between rollers *1* and *3*. Enamel from cups flows by gravity through feed pipes to steadily drip enamel on the knurled-face "edge" rollers which roll color on the edges of of slats. As the slat moves forward, small brushes smooth out and remove any excess enamel from the edges.

Continuing, the slat advances between applicator rollers *3* and *4*, where its top and bottom sides are coated. Enamel flowing through a metering valve from the supply tank *A* strikes roller No. *5* just in front of its highest point. Roller *6* smooths out the enamel stream on roller *5* before it is fed to applicator roller *3*.

Coating the under side of the slat is accomplished in a similar manner except in this case roller *8*, operating in a pan of enamel, picks up enamel which in turn is transferred to roller *7* and finally to the applicator roller *4*. Thickness of the coating is controlled through adjusting the supply stream and the pressure between rollers *3* to *5* and *4* to *7*. *(Page 76)*



Over all view of Venetian-blind-slat roller coating machine in operation. Notice, particularly, the hopper feed at right and the receiving and drying racks at left.

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TESTS TO DATE SHOW THE FOLLOWING PROPERTIES:

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Superior salt spray resistance, still going after 125 hours, 20% sodium chloride at 95° F.

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Superior grease resistance, no effect from vegetable animal, petroleum greases.

THE DURANITE family of tough, fast-baking finishes has served the metal-finishing industry with distinction for a dozen years. It was among the very first in the field to provide faster production properties combined with the abrasion and chemical resistance so necessary in modern metal finishing.

Now we offer another member — Duranite-H — made from an entirely new resin base which provides the new, highly desirable properties shown above. Let us show you how Duranite-H will improve your finishing.

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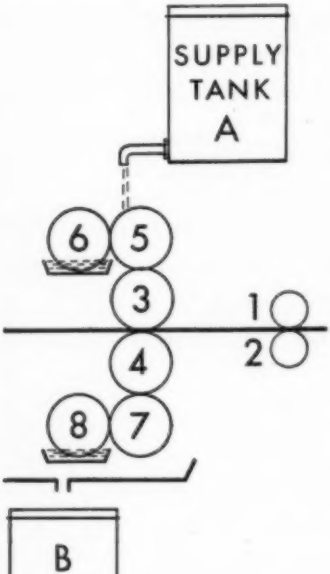
zapon production finishes

All wood parts such as slats, tilt and head bars and valance fascia are primed and given two finish coats. This is all done by roller coating. Each coat air dries over night. Production on this machine is 30,000 to 35,000-lineal feet per 8-hour shift, depending upon the operators.

Drying racks are shown in service in one of the accompanying illustrations.



(Edge coating rollers and brushes, not shown here, are located between rollers 1-2 and 3-4.)
1—Idler hold-down roller (steel).
2—Driven feed roller (steel).
3&4—Applicator rolls (rubber covered).
5&7—Transfer rolls (steel).
6&8—Supply rolls (rubber covered).

Labeled Containers for Solvents

CONTAINERS of organic solvents should always be carefully labeled, to avoid solvent accidents. These chemicals are generally colorless, often have a pleasant odor, and may therefore be mistaken for harmless liquids. In this way, unlabeled containers of solvents may lead to accidents as a result of ingestion or inhalation of the vapor. Moreover, the fire hazard of flammable solvents is not apparent unless clearly stated on the label.

Manufacturers of solvents, to prevent misuse of their products, use warning labels which indicate measures needed to assure safety. These labels have been developed by the Manufacturing Chemists Association and are published in its Manual L-2.

Drums or containers of solvents, if shipped directly from the manufacturer, are usually correctly labeled when they arrive at the plant. Frequently, however. the drum is kept in some centrally located spot, from which cans or bottles are filled. If these smaller containers are not properly labeled, the user is left ignorant as to the nature of the liquid he is handling and injury to health or a fire may result.

For solvent safety, it is important that every container, whatever its size, carry a label duplicating the information on the original drum. When containers are refilled, labels should be compared to prevent refilling with the wrong solvent. Supervision by responsible plant personnel at the point of distribution is advisable, to make certain that these rules are carried out.—SAFETY RESEARCH INSTITUTE.

Coating Products with Flock

By ARTHUR P. SCHULZE

SURFACE-COATING metal, wood, paper, cloth or plastic surfaces with rayon or cotton flock has steadily increased in importance throughout industry during the past few years. Today the technique is being employed with excellent effects on products ranging from cameras to radios. I believe that flock-coating is now receiving closer study than ever, by product designers and production managers.

Flock may be used to coat an entire surface or to print designs in one or more colors. Experience shows that practically any surfaces can be flock-coated effectively. The most startling transformations are those produced on paper and cardboard. Some advertising car cards and greeting cards have flock-covered designs.

What Flock is; Where And How it is Used

Composed of finely cut particles of synthetic, vegetable or animal fibers, flock has made entirely practical the production of synthetic suede and pile surfaces. Among the more common examples are velvet and suede shoe cloths and rugs.

Rayon flock gives a velvet or plush pile surface, while cotton flock provides a suede or broadcloth surface. Flock is adhered to surfaces by an adhesive and in that way it produces a permanent coating of both decorative and protective value. It is generally available in a variety of lengths and colors—in rayon, cotton, wool and certain types of animal hair.

While flock is often used as an over-all surface coating, it may be applied with equal success to selected areas. When used for this purpose it may take a wide variety of forms, for example, simple panels, stripes, or patterns and designs having a high degree of accuracy and considerable complexity. The character of the resultant surface is governed largely by the particular type of flock employed.

Among the more popular effects are the following:

Suede leather effects are produced by use of specially processed flock of rayon fibers designed to give a realistic suede effect on any surface and in typical leather colors such as gray, tan, taupe, chamois, or green, red, blue, etc.

Velour effects can be obtained in virtually any color desired through

the use of a particular flock composed of uniformly cut rayon fibers. Velvet effects are produced by the use of a special type of flock in practically any desired color. Fur effects are secured with a rayon flock that gives a semblance of fur for toys and similar novelties.

Mohair effects obtained by using flock are suitable for certain types of panels and interior fabrics, as for automobiles and aircraft. Rayon flock, which is usually specified to secure this effect, is available in an unlimited color range.

Felt effects are produced by using either cotton flock or rayon flock. This provides a soft surface that has such features as cushioning, sound-deadening, accoustical, non-mar, or friction. All colors are available; however, inconspicuous colors are preferred and recommended in average practice.

A walking surface can be produced by using a special animal fiber raw material called "Harecote", which is used for carpets and floor mats.

Flock Coatings Can be Durable and Cleanable.

Permanent, durable and cleanable, the flock coating becomes an integral part of the material on which it is used. Various types of adhesives may be employed but in most instances the choice of the adhesive depends upon the use to which the material or product is to be put.

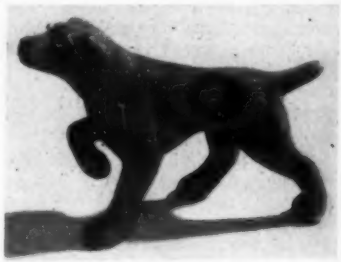
A brief word about adhesive power: Practically all industrial adhesives give dependable results when the adhesive is handled under proper technical guidance.

Durability of the flock coating depends chiefly on three essential factors: 1) type of flock, 2) method of application, and 3) type of material coated. Of further interest in this connection is the fact that to meet the requirements of durability, flock having a considerable "body" must be applied to a substantial base material.

Cleanability is provided by selection of a suitable adhesive and by planning the flock and the base to assure sufficient "nap" that will withstand reasonable cleansing action. Flock may be dyed to give fast colors.

Industry Uses Flock More Extensively and Effectively

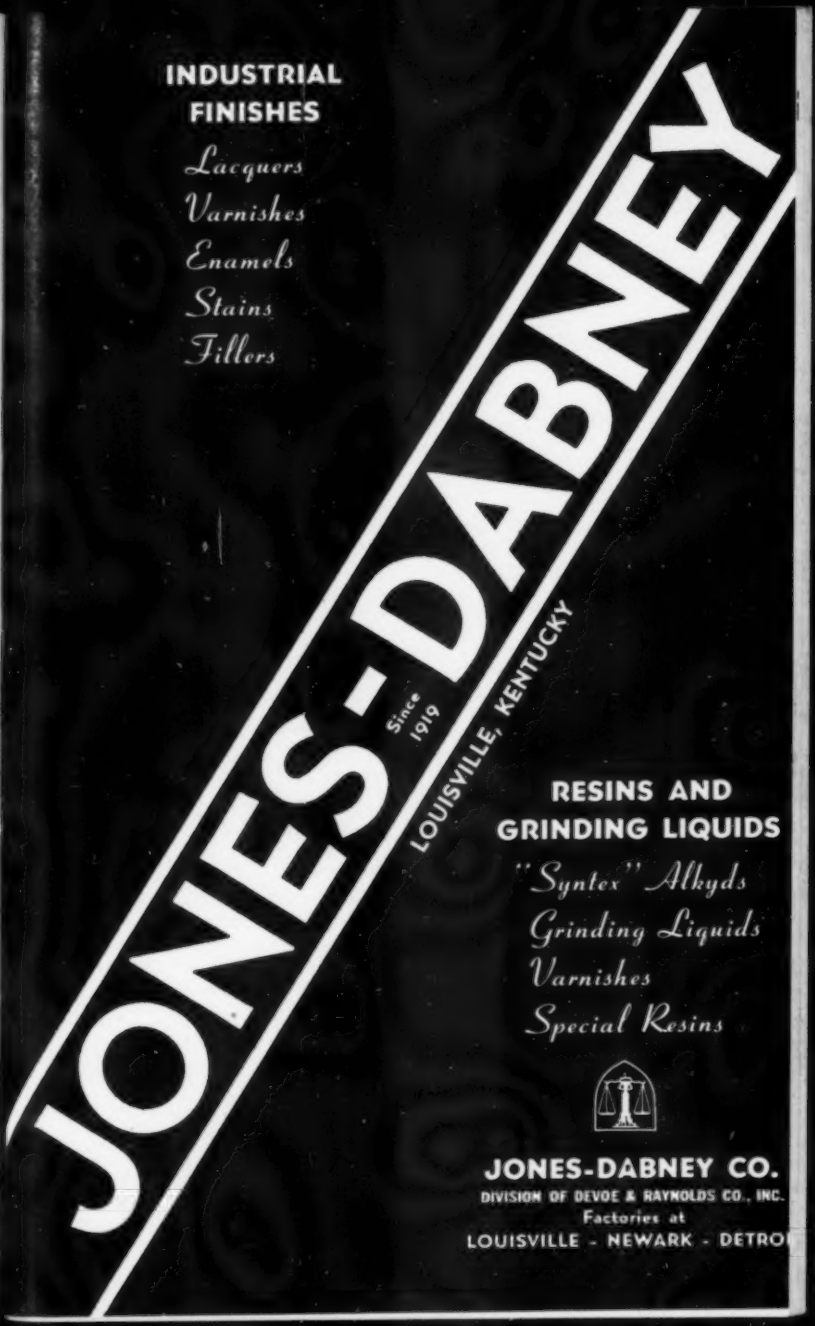
Applications of flock by industrial finishers and other users vary widely in scope and purpose. By building up an area or an entire surface, for example, the recommended cotton flock can serve as a built-in felt washer—as in cameras—or as an integral sealing medium, similar to a gasket.



A brown flock finish gives this dog a realistic coat of short hair. Photo, Myers-Lipman Wool Stock Co., Inc.

Take radios and phonographs, for instance. Coating the sound chambers of these units has proved to serve an efficient accoustical purpose. Flock is utilized to coat thin metal sheets—as in instrument panels—to absorb hum and other sound interference. Also, when applied between joints in metal, it effectively helps to prevent development of squeaks.

(Continued on page 80)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Still another use of flock capitalizes on securing such functional effects as cushioning, non-mar, or friction surface. Since it affords a cushion surface, flock is obviously valuable for drawer linings, instrument cabinet linings, non-snagging clothes containers, as well as for the bottoms of vases, lamps, etc. Also, it provides a friction surface, as in the case of record turntables and telephone bases.

A fourth outstanding example of flock's application versatility is the packaging industry. Here, the application of flock offers almost limitless possibilities. The deluxe effects achieved have great eye-appeal and selling power. Unusually striking and effective, for instance, are jewelry and gift cases of suede or velvet appearance outside and velour inside.

Even in window displays flock plays an important role. It steps up their potential utility, increases visual appeal and enhances their artistic distinction. Many displays employ flock to simulate the effect of leather or velvet or velour in combination with the plastic. glass, wood or cardboard of the display. Striking results are secured in counter and store signs as well as in theatrical decorations. Unique window dressing panels and accessories are obtained economically with flocked material; brilliant color effects are achieved.

Flock coating in color on a bottle of deluxe after-shave lotion. Photograph, courtesy of Rayon Processing Co.

Flock is Applied by Vibrating or Spraying

Various methods may be used for applying flock, but the two most widely employed today are vibration and spraying. The first method, considered best for flat surfaces, provides for applying the flock adhesive either by means of a silk screen for design work, or by conventional roll spreader equipment for over-all coating. Flock is then screened or brushed from a hopper arrangement directly onto the wet adhesive. The material being flocked is vibrated.

To accomplish this objective, the material is placed on a series of rotating square or hexagonal beaters whose vibrating bars agitate the base material. Flock is thus distributed over the material and any excess flock is shaken off and collected in a suitable receptacle under the flocking unit for further use.

Another flock-coating procedure consists of first spraying an adhesive onto the piece to be flocked. Dry flock is then applied to the wet adhesive through a specially

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developed flock spray gun, which can be bought from leading makers of spray equipment.

After the adhesive has dried thoroughly, excess flock not anchored in the adhesive is blown off with a light air blast. Suitable adhesives for flock are available at several dependable sources.

In conclusion, it may be safely said that so numerous are the possibilities of flock-coating that manufacturers of all kinds of products are carefully considering its use, and many present users are planning to employ it in additional ways. In several applications, according to rapidly accumulating plant experience, there are standards and precedents; other proposed uses involve pioneering research.

To assist industrial finishers and others in determining the suitability of flock for their particular products, the nation's foremost flock makers offer a large fund of engineering experience and specialized knowledge, plus competent research facilities—a unique, successful combination freely available to all who have flock-coating problems.

Turco Products, Inc., Advances Two in Technical Department

The promotion of Donald A. Keating, placing him in charge of the Technical Department for the Mid-Western Division, has been announced by Turco Products, 6135 S. Central Ave., Los Angeles 1, Calif. Operating from headquarters of the Mid-Western Division in Chicago, Mr. Keating will direct technical activities of the organization in 12 mid-western states.

Mr. Keating joined the Technical Staff of Turco in Los Angeles in June of 1946. Since that time he has served as Technical Service Engineer, specializing in major industrial problems, such as aircraft engine decarbonizing and maintenance; railroad washing operations and cleaning procedures for the food industry.

Turco Products, Inc. also announces the advancement of Mr. James D. Schwedler, placing him in charge of the technical activities for the company's southwestern division, with headquarters in Houston, Tex. Mr. Schwedler is to direct all technical service activities of the organization in the southwestern states, specializing in industrial cleaning problems.

Control Humidity for More Comfortable Air

Excess humidity in the atmosphere is responsible for the chill, shock and clamminess we often experience in ordinary air-conditioned places. A colorful 8-page booklet published by Surface Combustion Corp., Todeio, Ohio, entitled, "Control Humidity if You Want to Get the Most from Comfort Air Conditioning" is being offered free to persons interested in personal comfort in air conditioning. It will be mailed upon request on a company or professional letterhead.

Pierce & Stevens Appoints Two Important Men

As part of a long-range expansion program, Pierce & Stevens, Inc., Buffalo, N. Y., recently announced two additions to the sales staff.

Mr. John A. Russell, formerly sales manager of a large Philadelphia corporation, will represent the organization as field sales engineer in the Philadelphia district. Mr. Russell attended the University of Pennsylvania prior to entering the U. S. Navy in which he served for four years.

Byron C. O'Keefe & John A. Russell

Mr. Byron C. O'Keefe, recently engaged in chemical sales engineering in service with a Chicago chemical company, has been appointed field technician in and around the Buffalo area.

Among the products manufactured by Pierce & Stevens, Inc., are lacquers and allied protective coatings, adhesives, thinners and special solvent blends.

Properties of Urea-Alkyd Wood Finishes

BY ROLLIN H. WAMPLER

WITHIN THE past decade a new and different type of furniture finish has come into use. It has been called by many names because no one knew just what to call it. It usually appears under some trade name. Sometimes it is called synthetic varnish, heat-converting varnish, urea-formaldehyde furniture finish, or just UF finish. To simplify matters we will call it urea-alkyd wood finish, since urea and alkyd resins are the two principal ingredients.

This material is designed to spray at 40% to 45% solids. One coat over lacquer sealer is usually sufficient. After a short flash period at room temperature (about 30 minutes), the furniture is placed in an oven and the finish is cured on a schedule such as the following: One to two hours at 140° to 150° F. or four hours at 120° to 130° F.; or overnight at 110° F. Air drying is not practical with a urea-alkyd finish.

Feature of This Finish Is the Catalyst

The distinctive feature of this finish is the fact that a catalyst incorporated in the material permits the thermosetting urea resin to cure chemically at comparatively low temperatures. In other words, the urea resin portion of the material converts to a stage where it is infusible (cannot be melted by heat) and insoluble.

The catalyst may be incorporated in the material by the manufacturer, or it may be shipped separately, the correct amount to be added at the time of use. With the development of newer and more powerful catalyst, the trend is toward shipping the catalyst separately on account of the stability problem. Some manufacturers incorporate the catalyst in a special reducer, to be added at the time of use.

The urea resin used in these finishes is similar to, and has many of the same properties as the urea resin glues so widely used in the woodworking industries.

In the paragraphs that follow we shall describe some of the characteristics of the urea-alkyd finishes and the problems that may be encountered in their use. It should be understood that these finishes may vary greatly in their properties, depending upon formulation. Statements must be considered as general and will apply to the majority of these materials, however they may not be altogether true of any one product.

A Fast Finish

One of the major advantages of the urea-alkyd finish is the possibility of speed in furniture finishing. This is particularly true

where the finishing operations are conveyorized. It is possible to run the conveyor through the oven, so that furniture does not have to be handled until it is ready to rub. As soon as the furniture is cool the finish is ready to rub and pack without danger of cutting through or printing. Finishing schedules on conveyor systems, using a urea-alkyd finish, may require only four to six hours to complete.

Comparative Cost

Urea-alkyd finish material costs more per gallon than either lacquer or rubbing varnish. However, because one coat is usually sufficient in contrast to two for lacquer, and because the coverage is about 75% to 100% greater than that of lacquer, the direct cost of finishing with urea-alkyd furniture finish is considerably lower than with lacquer.

The direct finishing cost is usually a trifle higher compared to rubbing varnish. However, when the cost factor is considered in connection with the saving in time, the urea-alkyd finish may be more economical in the final analysis. This is especially true if the production rate is high. One manufacturer has estimated that direct finishing costs with the three types of materials are as follows:

Urea-Alkyd	$.087 per sq. ft.
Lacquer	.105 per sq. ft.
Rubbing Varnish	.085 per sq. ft.

These costs are in line with estimates from other sources.

Catalyst Affects Stability of Material

After the addition of the catalyst, urea-alkyd finish materials will gradually thicken to a point where they are no longer usable. The material will finally set to a firm jell that cannot be removed from the drum. With the older finishes that are shipped with the catalyst added, about six months is the maximum length of time they can be kept under favorable conditions. Some are stable for longer periods, but they usually become deficient in curing speed and solvent resistance. Also, there is some evidence to support the view that films applied from such old catalyst-conditioning materials are inferior to those applied soon after the catalyst is added.

Where the finish material is designed for the catalyst to be added by the user, the useful life of the material after addition of catalyst is much shorter. It should be used within a week or ten days. Before addition of catalyst, the material may be considered to be stable from six months to a year.

Drums of urea-alkyd should never be stored out-of-doors or near steam pipes if they contain catalyst. The heat developed under these conditions may cause the material to jell. The oldest drums should be used first; otherwise an old shipment may be pushed back and forgotten, then when needed the material may no longer be fit for use.

Proper Curing Produces Hard Finish

When properly cured, urea-alkyd finishes dry through very hard. When heat is applied for curing, the finish has as much "snap" as lacquer. Users of rubbing varnishes are usually amazed the first time they see a demonstration of the hard, positive drying of the urea-alkyd finish. Some formulations will actually be dust free in 30 minutes and absolutely hard and tack-free when they come from the oven. These properties can be varied by changing the type and amount of catalyst. *(To page 92)*

We don't lay claim to infallibility. But we do manage, pretty consistently, to supply finishes that escape the efforts of others. Why not, then, look to us for the finish you need?

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Because of this hard drying, special rubbing procedures must be used. The rubbing should be done with wet-or-dry sandpaper, starting with No. 360 sandpaper and finishing with No. 400. A mixture of kerosene or naphtha and rubbing oil is the usual lubricant. After cleaning up by the usual methods the finish may be buffed to a high gloss, if desired, by means of mechanical buffers sometimes used on lacquers. However, a urea-alkyd finish will not produce quite as high a polish as will a first-grade polishing lacquer.

Thermosetting Property Produces Print Resistance

Because a urea-alkyd finish may, for all practical purposes, be considered to be thermosetting, it has a very high order of print resistance. Printing is plastic flow induced by heat and pressure. The print resistance of a well-cured urea-alkyd finish is approached only by that of a high grade lacquer. No rubbing varnish, applied on the usual schedules, will compare in this property to a good urea-alkyd finish.

In practice, this means that the finish will not print in the shipping carton or in service. For instance, a dining room table finished with a urea-alkyd finish and properly cured will not stick or print under hot dishes. Pads to protect the finish are not needed.

A Solvent and Water Resistant Finish

Since the finish is thermosetting, it has a high degree of resistance to such solvents as alcohol and lacquer-type solvents. In service this means that liquor, perfumes, nail polish, nail polish remover, and such materials will not damage the finish as readily as they will most lacquers and rubbing varnishes.

The ultimate solvent resistance of the finish depends upon many factors. With any given formulation, increasing the catalyst increases the curing speed, solvent resistance and hardness of the film. By the same token, too much catalyst may cause poor stability, blistering, poor adhesion, difficult and unsatisfactory rubbing, and poor water resistance.

Age seems to improve solvent resistance of a urea-alkyd finish. It seems to approach a maximum about three or four weeks after spraying and curing.

The best urea-alkyd finishes, properly catalyzed and cured, have a water resistance on a par with the best lacquers and rubbing varnishes. They will not water spot in service except under the most severe conditions.

Cold Crack Tendency Has Been Solved

Urea resin alone, cured at low temperature by the aid of a catalyst, is very brittle. During the curing of a urea-alkyd finish the urea resin shrinks in volume. This

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process was not well understood when urea-alkyd wood finishes first appeared, with the result that some of these finishes cracked and crazed within a year or two. Means of compensating for this loss in volume were devised, so that such finishes today seldom give trouble in this respect. The cold-crack test was used as an accelerated aging method for evaluating this property. Because of this preoccupation with cold-crack resistance, most urea-alkyd finishes offered by reputable suppliers have good resistance to cracking under adverse conditions. The best urea-alkyd finishes are on a par with the best lacquers in this respect, and both are better than most rubbing varnishes.

Undercoats Affect Adhesion

One of the most serious faults of urea-alkyd finishes arises from their thermosetting nature. They do not adhere well to other materials used as undercoats. The common practice is to apply urea-alkyd finish over a coat of lacquer sealer. The finish does not adhere well to even the best lacquer sealer devised for the purpose. This is shown by its tendency to pull loose from the undercoat when scratched. To attempt to compensate for this by formulating a softer, more thermoplastic urea-alkyd material sacrifices hardness, print resistance, and solvent resistance—the very properties that make it distinctive from other materials.

Perhaps the best that can be done on a commercial basis today is to use a tough, elastic, low-stearated, low-solids lacquer sealer. There is a real need for a more satisfactory sanding sealer for use under these finishes.

Urea-alkyd finishes show splendid results when used as a primer, that is, when the sealer coat is eliminated and two coats of urea-alkyd finish are used instead. But this introduces problems of partially curing the first coat, sealing, sanding, pin-holing, etc., that so far have not been solved on a production basis. If and when this problem is solved, the resulting finish, properly keyed into the wood, will have remarkable hardness, toughness and adhesion.

Proper Curing Prevents Shrinkage

Shrinkage in a furniture finish shows up as an apparent sinking into the pores, producing a "hungry" appearance with age. It is caused by two things: Plastic flow and decrease in volume of the film. A urea-alkyd finish will shrink badly unless it is thoroughly cured before rubbing. It was noted above that the urea resin loses volume during curing. Therefore it is readily apparent that unless this volume loss is carried to completion by proper curing it will occur with age anyway. It is unfortunate that a urea-alkyd finish

The snail makes a habit of switching shells. Tiring of his own, he'll crawl into any shell that's handy. His coating problem is easy to solve.

Perhaps your surface coating problem is more difficult. It won't be if you specify lacquer. It's the finish that's easy to apply. It air-dries fast, without costly drying equipment. It's attractive, durable, tough. Your lacquer supplier would like to tell you about it in more detail.

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CSC makes solvents and plasticizers, but is not a lacquer manufacturer.

may be rubbed before it is completely cured, causing shrinkage to show up later. Always cure the full time at the recommended temperature. Two hours at 140° to 150° F. is adequate for most formulations.

Comparing Abrasion And Mar Resistance

Properly formulated and cured urea-alkyd finishes have better abrasion resistance than most lacquers and rubbing varnishes. In service this means they will wear better under sliding, scraping motions as are encountered in moving things across a table or dresser top.

As we have seen urea-alkyd finishes have good abrasion resistance, but relatively poor adhesion to the undercoats in common use. The net effect is that such a finish will resist most wear and light blows quite well, but will flake off with a heavy blow. The best lacquer finishes usually have better mar resistance than the usual urea-alkyd finishes applied over lacquer sealer.

Finish Not Affected by Oil in Furniture Polish

One frequently overlooked advantage of urea-alkyd finishes is their oil resistance. Most furniture polishes contain considerable oil. If not wiped off well, the oil residue from repeated applications will, in time, soften the finish, making it sticky and easy to damage. Varnishes in particular are subject to such damage. The best lacquers are highly resistant in this respect, as are the best urea-alkyd finishes.

Because many urea-alkyd finishes set quickly in the air to a firm surface, they are subject to serious blistering when they first enter the oven. If blistering occurs it can be eliminated in various ways. Slower solvents and less catalyst will increase the setting time. Lowering the temperature with baffles at the point of entry into the oven will reduce the temperature shock which causes blisters. Thus a zoned oven may eliminate the trouble. Perhaps the oven has "hot spots," or local areas where the temperature is much too high. Perhaps the wood si not thoroughly dry. The humidity in the oven may be too low. Usually one or more of these things are responsible for blistering troubles.

C. F. Harris Heads S-W's Western Industrial Sales

Mr. Claude F. Harris has been appointed Western Manager of Industrial Sales for The Sherwin-Williams Co., with headquarters in Chicago, Ill. Mr. Harris succeeds Lyman V. Webber, who held the post for a number of years but who has been unable to continue because of ill health.

Widely-known in the industrial paint field, Harris joined The Sherwin-Williams Co. January 1, 1938 to handle national accounts. Later he was made industrial sales representative for the Wisconsin area, the position he held prior to his present appointment. He has an exceptionally broad background of experience in wood, metal, and plastic product finishing and other phases of industrial painting. He filled an important administrative position with a prominent paint manufacturer in the Detroit area where he was located prior to becoming associated with The Sherwin-Williams Co.

C. F. Harris is new head of the Western Industrial Sales for Sherwin-Williams Co.

NEW PERIOD
Production Finishes

BAKING ENAMELS | LACQUERS SHELLAC | ENAMELS FILLERS | SEALERS SUPPLIES | PRIMERS STAINS | SYNTHETICS VARNISHES

Our Field Representatives

New Period field men are well trained and have a good background of practical experience in production finishing. They have a splendid record of service to manufacturers of all kinds of products who have been faced with difficult finishing problems.

You are invited to call on our field men to help you with your production finishing problems, no obligation, of course. It may save you time, money and costly delays.

The complete New Period line includes sealers, gloss, semi-gloss, clear and pigmented lacquers. They are formulated for various methods of application and for any production setup.

A production sample will convince you of its superiority.

Our complete line of New Period finishes and our laboratory facilities are at your service. Write us!

NEW PERIOD
Production Finishes

ESTABLISHED 1917

NEW YORK WOODFINISHERS' Supply Co. INC.

109 IMLAY STREET BROOKLYN, N. Y.

Letters from Readers

Magnetizing Metallic Paint?

We understand that there is a process of magnetizing small metal parts so they can be sprayed with low-pressure spray guns using some sort of metallic paint or lacquer, which process is claimed to save a great amount of paint. Can you give us any information on this or advise us where we could secure it?—N. Mfg. Co.

You probably have in mind the electrostatic spraying process, patents for which are held by Harper J. Ransburg Co. (Electrostatic Coating Divn.), 1238 Barth Ave., Indianapolis 7, Ind. Several articles about this have been published in past issues of INDUSTRIAL FINISHING Magazine, the last one being in August, 1947 issue, see pages 28, 29, 30, 31 and 32.—Ed.

Gold Metal Leaf

We would like to have tear sheets on the article appearing in July, 1947 issue—the one entitled, "Gold and Metal Leaf Applied to Fine Frames." If you do not have tear sheets, may we have a copy of the July issue of INDUSTRIAL FINISHING? Your very fine publication is getting hard usage in our Industrial Department.—W. P. Fuller & Co.

Copy of magazine sent.—Ed.

Painting Plastics

In your August issue the article, "Painting of Formaldehyde Plastics," by John F. Daymude, is one of real interest. We believe there is much in it that all members of the molding fraternity and the phenol formaldehyde compounds could profit by.

We would like permission to reprint this article and use it as a part of our monthly publication, the "Durez Molder," which goes to contract molders. Copies of the Molder are being forwarded. We would, of course, give full credit to your magazine and to the author. If the thought is agreeable, we would like to use the material in our October issue.—Durez Plastics & Chemicals, Inc.

Permission granted.—ED.

Roller-Coating Machines

Please send us the names of some of the manufacturers of roller coating machines for applying paint.—E. H. Co.

Try Chas. E. Francis Co., Huntington, Ind.—ED.

Paint Mixers

I am interested in securing the names and addresses of manufacturers of paint mixing machines, paint tumblers and paint agitators. Is it possible for you to secure such a list from your files and send it to me?—T.S.W.

We haven't a large or complete list, but are sending you the names and addresses of some of the better known firms in this line.—ED.

Who Buys Paint Sludge?

In a recent issue of your magazine INDUSTRIAL FINISHING, there was an advertisement by a company located some place in New Jersey, to the effect that they purchased the sludge accumulated in tanks from paint spraying. We would appreciate your advising us the name and address of this company, so that we can get in touch with them.—A.C.D.

Perhaps you are thinking of Solvents Recovery Service, 1019 Broad St., Newark, N. J., who have a process of recovering solvents and thinners from paint sludge, waste or spoiled lacquers, etc. They do this for concerns who send in the sludge, waste materials, etc. One of their advertisements appears on page 130 of August 1947 issue of this magazine.

Glass Beads Wanted

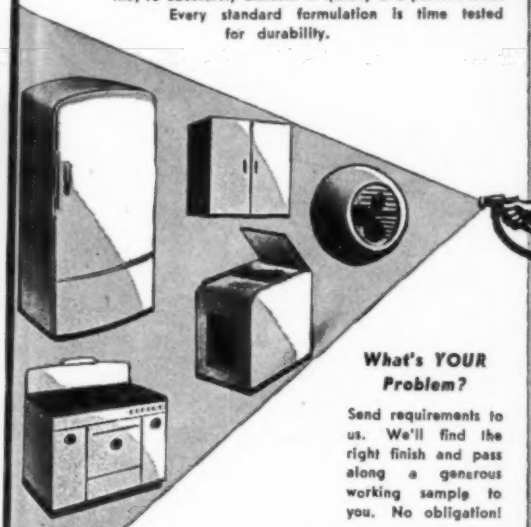
I am writing you for information concerning manufacturers of small glass beads used on outdoor signs to make them highly reflective, and will appreciate receiving the names and addresses of such firms.

It has been brought to my attention, on several occasions, that a special paint is being employed (not luminous

OU'RE ALWAYS IN FIRST PLACE ....WHEN YOU FINISH WITH UNITED

NITED LACQUER PRODUCTS have "what it takes" to keep pro-ction and sales both moving fast. Free flow, rapid drying, and hard, tough, perfect finish increase the "eye appeal" of your niture, fixtures and appliances.

NITED High Speed Lacquers have been tried, tested and proved superior by manufacturers. In gloss, satin or dull finishes they're absolutely uniform in quality and performance. Every standard formulation is time tested for durability.



What's YOUR Problem?

Send requirements to us. We'll find the right finish and pass along a generous working sample to you. No obligation!

"FIRST WITH THE FINISH"

LACQUERS
THINNERS
SYNTHETICS
METALLIZED FINISHES
SPECIAL COATINGS

United Lacquer Mfg. Corp.

General Office, Laboratory, Factory: LINDEN 3, NEW JERSEY
New England: EVERETT, MASSACHUSETTS

or fluorescent) in the painting of outdoor advertising signs which causes them to shine brilliantly when an automobile headlight is directed on them, more so than with ordinary colored paint. If you have any information available kindly let me have it.—A. P. Co.

We understand that these glass beads are made and supplied by Prismo Safety Corp., Huntington, Penna. We do not know of any other concern that manufactures these glass beads. Can some reader help us on this?—ED.

Plastic Coated Wire

Can you furnish us with the address of the New England Tape Co., Inc., referred to in the June issue of INDUSTRIAL FINISHING, as manufacturers of Plastic Coated Wire?—G. R. W.

It's 30 Tower St., Hudson, Mass.

Graining Rollers

Please give us the names of some manufacturers who make light weight composition rollers for graining. We understand there are rollers made with a light aluminum core, thereby reducing the weight of a large roller.—S. F. Co.

We are sending you a list of graining roller makers, but do not know which one, if any, supplies rollers with a light-weight aluminum core.—ED.

Decal Article Wanted

We have in mind an article by Mr. C. F. Newburg, General Superintendent of United Specialties Co., Chicago, entitled, "Decals Applied in Mass Production" (Aug. 1947 issue). We would appreciate receiving one dozen reprints of this article, if this can be arranged.—E. C.

No reprints were made of the article, but we are sending you a few tear sheets of it from mutilated copies.—ED.

Mechanical Striper

In August issue we noticed a mechanical striper used on an enamel finished guitar. We are interested in finding out where we can purchase a mechanical striper.—A. M. P.

The striper you saw illustrated is made and sold by Paasche Airbrush Co., 1909 Diversey Parkway, Chicago 14, Ill.—ED.

We are attempting to locate a striping tool for applying colored lacquer stripes on golf club shafts. We would appreciate your prompt attention in notifying the writer the names and addresses of companies that can furnish this type of tool.—S. C.

Try the firm mentioned above.—ED.

Painting Plastics

One of our plant department heads is eager to obtain tear sheets of an article entitled "Painting of Phenol Plastics", which appeared in the August 1947 issue. If you can conveniently do so we would appreciate it if you would send us a copy of this article so that we can pass it along to him.—C. J. T.

Copy sent.—ED.

What to do With Dry Paint Sludge

Once each week we clean out our spray booths. However, proper disposal of the laquer dust has always been a problem. We have been in the habit of letting such material accumulate for a couple of weeks by placing it on a vacant lot back of our lumber yard and then set fire to it. Naturally this disposes of it in its entirety. This has never proven very satisfactory, particularly right here in the city because heavy black smoke emanates when the lacquer dust burns.

Such material, if allowed to accumulate for a while also represents a hazard for the reason that at times it starts to burn without being ignited, by what we think is spontaneous combustion.

Have you any suggestions to offer for a better way of disposing of such material? Do you know how other manufacturers handle the disposal of it? Is there any material in which it could be immersed that would probably bring about disintegration and eliminate the need of burning it?—C. F. Co.

We solicit suggestions on this.—ED.

Infra-Red Drying of Grey Iron Castings

We are desirous of obtaining practical information as to the success and utility of using infra-ray red lamps in the drying of synthetic enamels on grey iron castings. Weights of castings vary from 10 to 150-lbs., and shapes are irregular. If you can make recommendations or advise who can make recommendations, we will appreciate your so advising.—F. W. Co.

In order that you may obtain specific information on this subject, we believe that a qualified infra-red heating engineer would have to call on you and look over your proposed setup and the products or parts you propose

SUPERIORITY UNIFORMITY PYRO-CELLO-FILM

P. A. Starck Piano Company, Chicago

chooses

PYRO-CELLO-FILM

because it is more heat, alcohol, acid and scratch resistant than any other organic finish.

Truly the wonder finish for fine wood products, PYRO-CELLO-FILM has the endorsement of many leading manufacturers throughout the country. Its durability and wear resistant qualities are matched only by the satiny lustre imparted to all woods and wood veneers. Apply PYRO-CELLO-FILM as you would any commercial organic finish. The results will amaze you.

PYRO-CELLO-FILM is an exclusive development of The American Varnish Company.

SUPERIORITY UNIFORMITY AMERICAN

Let us finish one of your wood products with PYRO-CELLO-FILM—without cost! See for yourself how wonderfully it solves your finishing problems. Write for complete information —today!

AMERICAN VARNISH COMPANY

1126-1140 N. North Branch Street—Chicago 22, Ill.

Manufacturers of varnishes—paints—stains—lacquers—synthetic enamels—cello film—soldering flux and special coatings.

to treat. Experienced engineers and service men who are fully conversant with the possibilities and limitations of infra-red drying on all kinds of metal products are to be found in several well-known concerns. In a letter we are submitting the names and addresses of some of these concerns.—ED.

Viscosity Cups

I will be very much obliged if you will give me the address of a company that sells or manufactures viscosity cups.—R.W.L.

Try Vol-U-Meter Co., Buffalo 16, N. Y.—ED.

Can Supply Metal Cleaner That Isn't Intoxicating

We are interested in M. S. I.'s letter in Sept. issue, on page 100, entitled "Metal Cleaner that isn't Intoxicating," inasmuch as we have a machine in successful operation, using a non-intoxicating chemical, and doing the same type of work for which your reader requests aid. We wonder if it would be asking too much to let us have the name of the user of this equipment?—Industrial Washing Machine Corp.

Information supplied.—ED.

How to Fail in Business

Dear Editor: Around my neck of the woods an old bird once ran a hot dog stand. He had no education; couldn't read or write but all day long he kept chirping that he had the best barking beef in town, and soon he was selling hot dogs like hot cakes. He was so busy he couldn't listen to the radio and before long he had a bankroll that could choke a hawk.

"Guess I'll send my son to college," he mused. "Don't want him to be as dumb as me." So, son went to college, came home for his summer vacation, found Dad still feathering his nest with hot dog sales talks.

"Listen, pater," twittered Junior. "Better watch your step. Conditions are terrible, inflation is coming, the atom bomb can wreck civilization, and with bureaucrats, high taxes, strikes and high prices, it looks like an Iron Curtain for Free Enterprise."

"Gosh," cried the old man, "I never knowed it. That's what you get when you ain't had no education." So, he cut down his orders for hot dogs, quit telling the world he had the best in town and sure enough, business got so bad he had to shut up shop.

But, son went back to college and the old man was happy. "Ain't education wonderful," he cried. "If my boy hadn't told me that things were in such a mess, I'd still be hollering my damnfool head off and losing my tail feathers in that hot dog stand."

A lot of birds get lost in the woods because they listen to the cuckoos and don't mind their own business. —Very wisely yours, OLLIE THE OWL.

Tumble Finishing

We are interested in securing a machine for the tumble finishing of large wood parts, such as dowels and toy gun stocks. Can you give us the names of manufacturers of this type of machinery?—M. P. Co.

For tumbling barrels, try H. M. Kenyon Co., Chicago 6, Ill.—ED.

In the September issue, page 100, we notice an inquiry from "W.-W. Co." regarding tumbling equipment and finishing. Inasmuch as our company specializes and furnishes a great many of wood handle manufacturers who finish with a tumbling process, we believe we are in a position to be of some assistance to the W.-W. Co., and we will appreciate any information you can give us, so we can make direct contact with them.—Boston Varnish Co.

W.-W. Co. is Custom Wood Working Co., Grand Haven, Mich.—ED.

Roller Coater Wanted

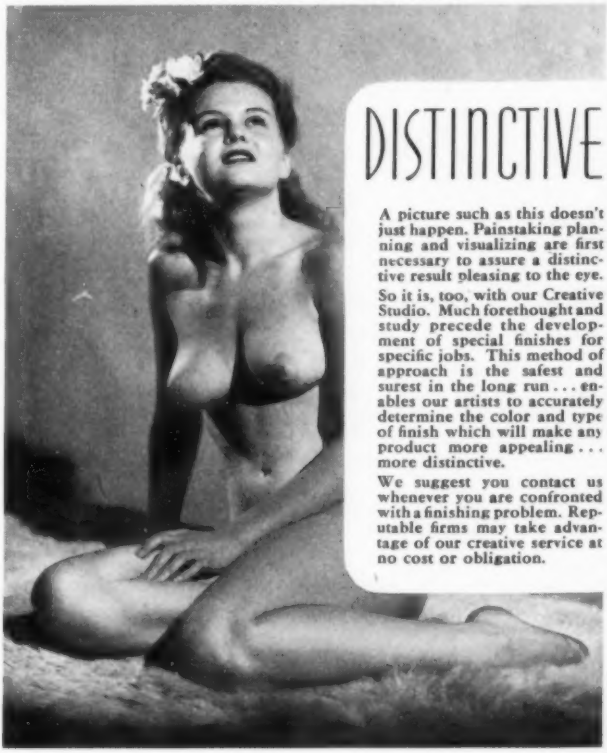
We read in your June issue, an interesting article on "Roller Coating" by I. Basso. We would be much obliged if you would kindly let us have the address of the manufacturer of this roller coater.—E. W., Paris, France.

This machine is a product of Gasway Corp., 6463 N. Ravenswood Ave., Chicago 26, Ill.—ED.

Flock Finishing

In reading the September issue, I find some interesting comments regarding flock finishing. In your comments on this, I note that you had an article in January 1947 issue wherein you elaborated on this type of finishing. I would appreciate receiving a copy of the January 1947 issue.—M. M. Corp.

Copy sent.—ED.



DISTINCTIVE

A picture such as this doesn't just happen. Painstaking planning and visualizing are first necessary to assure a distinctive result pleasing to the eye.

So it is, too, with our Creative Studio. Much forethought and study precede the development of special finishes for specific jobs. This method of approach is the safest and surest in the long run . . . enables our artists to accurately determine the color and type of finish which will make any product more appealing . . . more distinctive.

We suggest you contact us whenever you are confronted with a finishing problem. Reputable firms may take advantage of our creative service at no cost or obligation.

No Tampering with Quality

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

Questions and Answers

What Is "Bonderizing?"

We are interested in securing complete information regarding the Bonderizing of finished metal surfaces for products in the appliance field. We will appreciate any information you can furnish us regarding the process or any suggestions you may have as to the availability of this information from other sources.—W. & Co.

Quoting from a book on "Bonderizing" by the manufacturer and supplier of Bonderizing materials and equipment, Parker Rust Proof Co., 2177 E. Milwaukee Ave., Detroit 11, Mich.:

"Bonderizing before finishing will stop the spread of rust and alkali underneath the paint film, even when the paint film is scratched sufficiently to allow corrosion to take place.

"The Bonderizing process may be applied to iron, steel, zinc, cadmium, and aluminum surfaces in either of two ways, depending upon the type of product to be treated and the amount of production to be handled daily. The two different methods of applying Bonderizing are by immersion and mechanical spraying.

"Like all metal finishing methods, Bonderizing requires a clean surface, and in both types of Bonderizing installations, the proper cleaning and rinsing equipment is usually included in the installation plans. There are, of course, many detailed variations to fit into the physical and production requirements, but such variations are worked out in advance by the Parker technical staff.

"The processing bath is prepared by mixing the necessary Bonderite chemicals with water. Processing is accomplished by either immersing or mechanically spraying the products for a sufficient length of time to transform the metal surface to a phosphate coating. The time required is from one to five minutes, depending upon the method used and the type of product being treated."

To Remove Old Filler from Floor

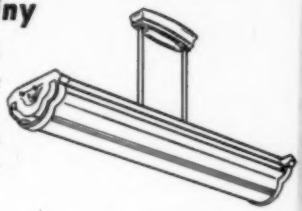
Over a period of years filler drippings have dried on our finishing room floor to a depth of about 2-in. Our foreman would like to know if there is some quick or easy method known for removing this dried filler. Can you help us with this problem?—D. & S.

We have consulted an ex-foreman finisher on this and he suggests the following: (However, this could only be used where you have a water-tight floor.)

Sprinkle a good thickness of sawdust over the filler covered floor and wet this down with water. It will need to be wet down repeatedly over a period of 24 to 48 hours. This thorough soaking will soften the dry packed-down filler to such an extent that you can take a scraping tool or something like a

HILO
LACQUER LEADERS

No. 4 Water White Clear Lacquer
Keeps Plating Bright and Shiny



One well-known manufacturer uses No. 4 Water White Clear Lacquer to protect the cadmium plated trim on his lighting fixtures. The crystal clearness and high lustre of this lacquer keeps these parts looking like they had just been plated and polished.

He sprays at a reduction of 1 part lacquer to 1 part of LL Lacquer Thinner. Four hours after being sprayed, the coating is hard enough so the fixtures can be wrapped and packed.

If your product is plated, try the extra *plus* of a protective coat of this No. 4 Water White Clear Lacquer.

Send for a free trial lot for test in your plant

HILO

HILO VARNISH CORPORATION

42-60 Stewart Avenue, Brooklyn 6, N. Y.

2420 Washburne Ave., Chicago 8, Ill. • Park Sq. Bldg. Boston 16, Mass.

sharp spade and remove it from the floor. This treatment doesn't involve any fire hazard nor danger to workmen.

It is suggested that you start this treatment near the end of the week—say on Friday afternoon—and continue the soaking treatment over the weekend. Then it will be ready to scrape off Monday morning.—EDITOR.

Grained Blond Oak Finish on Gum

As manufacturers of an extensive line of wooden display fixtures, we are interested in giving some of them a grained finish on gumwood. We want to reproduce a nice wood grain on the surface. In particular, we are out to reproduce bleached oak. This, we feel, will make our fixtures desirable to stores that cannot very well use them in a white lacquer finish.

Would you please enlighten us on this subject, giving us as much real information as possible? Also kindly name some manufacturers where the necessary tools, plates, etc., can be obtained.—H. & Z.

There are at least five methods of reproducing wood grain on a wood of even texture—one having no pronounced grain pattern.

1) Hand processes with brushes and other small tools require great skill, and are slow and expensive. The old finishing craftsmen did a lot of this, but few are left who can do this work. I do not think these methods are practical on store fixtures, especially if produced in volume.

2) Lacquer decalcomanias (lacquer films) are available in a wide variety of colors and patterns. No great skill is required in this transfer process. I believe it is thoroughly practical for store fixtures on relatively small areas. It is also practical for large areas, although more difficult to apply evenly; and on large areas the graining may have a slightly artificial look, especially on close inspection. This process may solve your problem.

3) Open-stencil process. There are metal stencils available that are very good. First a solid-hiding ground coat of proper color is applied. If the wood is even-textured and uniform in color, a semi-hiding ground coat or just a stain will give a more natural appearance to the job. Then the metal stencil is placed on the surface and color is applied with a stiff brush (a regular stensil brush) or by spraying. The design is then coated with clear gloss or flat lacquer for protection. The process is inexpensive, and adapted to small or large scale production.

4) Silk screen process. This well-known process may be just the solution to your problem. The background is suitably colored as described previously. Then the grain pattern is transferred through a silk screen, which can be purchased ready made to your specifications. This process is rapid and well adapted to small or large scale work.

5) Mechanical graining process. By this process the background is prepared as described above. The grain pattern in inks is transferred from an etched metal plate to a soft-surface roller, which is then rolled over the surface. In this process, as in methods 3 and 4, the pattern should be suitably coated with a clear finish.

I presume that by "bleached oak," you are referring to a finish sometimes called lime oak. It is a light color, with the oak as light

(Continued on page 110)

Being Accepted

ree School for Finishers

December 1-3, 1947
January 5-7, 1948
• February 2-4, 1948
• March 2-4, 1948

English Manor, famous show place, is the home of the Finishine Free School for Finishers

you are a professional wood-finisher or plan to become one, you are invited attend the Finishine School for Finishers. This valuable course is free to the ade only, and is conducted for the sole purpose of improving the skill of finishers roughout the country. There is no cost or obligation.

English Manor, where the school is conducted, is the home of E. W. Hagaorn, president of Finishine, and contains many pieces of rare furniture, Dresden ina, and other treasures which have been finished, restored or repaired with nishine products. The course includes high-quality commercial finishing as well the art of finishing, repairing and restoring rare and costly woods, porcelains, arble and other objects of art.

Reservations should be made on business stationery and will be accepted in e order in which they are received.

Send Your Reservation Now

Laboratories, Inc. **627 TALLMAN ST.**
SYRACUSE 4, N. Y.

in color as possible, and the filler white in the pores. There are a number of ways to reproduce this by the methods just described. Producers of the materials and equipment can determine the proper method in each case. If you want a natural oak color, with a very light brown filler in the pores, it can be reproduced very easily. You may have to do considerable experimenting to get just the effect you want, but it can be done.—ROLLIN H. WAMPLER.

Names and addresses of concerns that can supply equipment and materials are being sent you by letter.—ED.

Antique Bronze Finish

We are enclosing a seal which has a finish that we would like to duplicate. Could you please give us information on how it was obtained or where we could get information about it?—L. M. Spec.

(The seal, about the size of a silver dollar, appears to be made of thin sheet brass "welded" to a gummed paper back and is heavily embossed with clean raised letters and design. The high places are highlighted in a light stained brass color, while the low places are a dark brown of the color of aged bronze.)

Starting out with the embossed metal (or metal leaf on a backing of gummed paper) the face side is probably coated with a thin brown (antinque bronze) glaze—lacquer glaze, oil glaze or japan glaze—and then lightly wiped to remove the dark brown from the high places on the design, leaving the brown or aged bronze color in the low places, especially those close to the highlighted letters.

If you use a lacquer glaze, you will probably spray it. This will dry rapidly and the wiping will have to be done with a piece of fabric tightly stretched over the finger or a convenient tool. The fabric will be moistened (made damp but not too wet) with lacquer thinner.

An oil glaze dries more slowly. It can be sprayed on or brushed on and doesn't need to be wiped off so quickly. It can be wiped with a dry cloth stretched over the finger or any convenient wiping tool. A japan glaze will probably dry faster, so it will have to be wiped soon after it is applied.

All of these materials will air-dry.

What material has been used on the sample you have submitted, we do not know. However, several excellent concerns in your city (Cleveland) can supply a suitable material, and their service representatives or technical men can tell you exactly how to use it.—ED.

Production Show Next March

Plans for the 1948 Chicago Production Show of March 22, 23, 24, at the Stevens Hotel, have been announced by Paul A. Jenkins, executive secretary of the Chicago Technical Societies Council, sponsor of the Show and of the concurrent Chicago Technical Conference.

Attended largely by production executives of Chicago and the Middle West, the Chicago Production Show is an annual exhibit of materials, tools, instruments, handling equipment, and services designed to increase production volume and decrease production costs. The Chicago Technical Societies Council is located at 53 W. Jackson Blvd., Chicago 4, Ill.

Materials Handling Exposition

The National Materials Handling Exposition will be conducted for the second year in the Public Auditorium, Cleveland, Ohio, Jan. 12 to 16.

The show will run for five days, instead of four, and all systems of materials handling will be on exhibition.

FLEXIBILITY-PLUS

Are you looking for a finish that will aid your product? One that will stand up to extraordinary amounts of pressure and can be flexibly bent in any direction without breaking!

ALAKA is the answer to your needs . . . it stresses flexibility; and gives you the following products to choose from.

Adhesives and Cements
Aircraft Speed Finishes
Air-Dri Synthetics
Brass Lacquers
Bronzing Lacquers
Cellulose Acetate
Engine Lacquers
Finishes for Plastics
Fungus-Proof Lacquers
Glass and Porcelain Lacquers
Lacquer Enamels—All Colors
Marine Lacquers
Metallic Lacquers
Quik-Bake Synthetics
Synthalak Synthetics
Textile & Silk Screen Lacquers
Water Dip Lacquers
Wood Lacquers
Wrinkle Finishes
Zinc Chromate Primer

ALAKA LACQUER & CHEMICAL CORPORATION 220 FORTIETH ST. BROOKLYN 32, N. Y.

Materials Supplies Equipment

Nu-Da "Kil-Rot" Does It

Wood, canvas, rope and fabrics, treated properly with Nu-Da "Kil-Rot" will not rot or decay. The preservative contains copper and zinc naphthenate which destroy the bacteria and fungi that cause decay. "Kil-Rot" is a product of Indianapolis Paint & Color Co., Indianapolis, Ind.

New Metal Cleaners

A new line of metal cleaners has been developed by the Parker Rust Proof Co., Detroit, Mich. The new cleaners have been thoroughly tested by the Company's own laboratories and in production runs, and are now available to manufacturers of metal products throughout the country.

In servicing thousands of Bonderizing, Parkerizing and Parco Lubrizing installations for many years, the companies' key men were impressed with the vital relationship between proper surface cleaning and the durability of final finishes on metal. Their experience in the field of protection and preservation of fine finishes naturally taught them a great deal about what constitutes proper cleaning. They have applied their knowledge and experience to the creation of the new line of Parco cleaners to bring added efficiency and effectiveness to this vital problem of the metal industry.

The three classes of Parco cleaners for steel, zinc and aluminum include emulsion types, acid types, and alkaline types. They are specialized cleaners to meet varying specifications and conditions. Parco cleaners are formulated to make hard water suitable for cleaning, to rapidly remove soil from metal surfaces, to condition them for fine, dense Bonderite coatings, to remove rust and grease prior to painting, and to provide easier control and greater economy.

Protector Sleeves

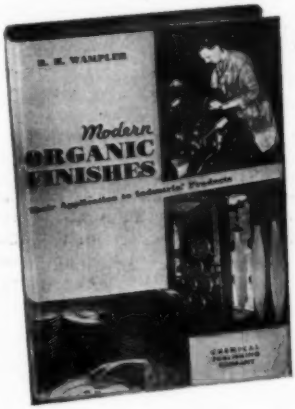
Protector sleeves designed for protection against acids, caustics and solvents, as well as dirt and splashing liquids of any type, made from Koroseal film, are announced by The B. F. Goodrich Co., Akron, Ohio.

Length is 16½-in. Elastic at both ends makes them easy to put on and take off, and gives a snug fit at top and bottom. They are easy to wear, and won't bind; light and flexible; easy to clean with soap and water, translucent, durable and dressy.

Minit-Kote for Cleaning and Phosphatizing Metal

Minit-Kote, a product of Klem Checimals, Inc., 14401 Lanson, Dearborn, Mich., is an emulsion of new and original composition—containing certain cleansing reagents together with phosphoric acid to prepare metal surfaces for painting. It frees metal surfaces from all traces of oil and dirt—removes light rust and tarnish—

MODERN ORGANIC FINISHES



Their application to Industrial Products

This book is brand new and contains 452 pages of the latest information on finishing. It describes modern finishing materials and equipment for their application, drying, conveying, etc., so that the reader may have an overall picture of modern industrial applications. Throughout, the main emphasis is on proper selection and use of materials to get the best possible finish at minimum cost.

Contents

MATERIALS: Oleoresinous and Alkyd Varnishes and Enamels; Cellulose Lacquers; Spirit Varnishes, High Integrity and Specialty Finishes; Stains, Wood and Metal Fillers, and Miscellaneous Finishing Materials.

MODERN APPLICATION METHODS:
Spray Painting; Dipping and Flowcoating; Roller and Knife Coating; Tumble and Centrifugal Finishing; Special Processes.

DRYING METHODS:
The Drying Process—Air Drying; Force Drying; Baking by Convection and Radiant Heat; High-Frequency Baking.

PRODUCT HANDLING IN THE FINISHING DEPARTMENT:
Conveying Methods.

FINISHING PROCESSES:
Wooden Furniture and Cabinet Finishing; Prefinishing Wood, Plywood and Hardboard Structural Materials; Special Industrial Wood Finishing Problems; Finishing Paper, Cardboard and Fabrics; Finishing Plastics and Resin-Impregnated Wood; Cleaning and Surface-Treating Metals; Finishing Automotive and Railway Equipment; Finishing Sheet Steel Products; Finishing Iron Castings; Finishing Aircraft; Rubbing and Polishing Organic Finishes.

SOME GENERAL CONSIDERATIONS:
Good Practice in the Finishing Department; Testing and Evaluating Finishes.

The price is $8.50 and to eliminate bookkeeping we ask that cash accompany order. Sold on a money-back guarantee. Money refunded promptly and without any questions if you are not satisfied.

INDUSTRIAL FINISHING Magazine

1142 North Meridian Street **Indianapolis 4, Ind.**

and at the same time deposits a light, but uniform phosphate coating on the exposed surface, which provides a better bond for painting.

The triple action of Minit-Kote is effectively used on sheet steel, castings and forgings or any ferrous product requiring preparation for painting. This preparation is also used to prepare aluminum surfaces for painting.

In a one-stage washer Minit-Kote can be used at a 2% by volume concentration—with a temperature of 160° to 180° F. So used it will remove oil and other solids —free the surface from light rust —and at the same time leave the surface with a light phosphate coating which provides a firm base for painting.

As a rinse for alkali cleaning, Minit-Kote can be used in a 1% by volume concentration. So used it provides a rinse which completely removes all traces of alkali from the parts—and also deposits a phosphate coating sufficient for the paint base.

Chemical Stripper Removes Paint Coatings

A new type chemical stripper that efficiently removes gilsonite, rubber-base and metacrylate finishes is being offered by Klem Chemicals, Inc., 14401 Lanson Ave., Dearborn, Mich.

The manufacturer, after exhaustive test, claims that this new stripper, called Klem No. 74, removes stubborn paints and enamels in sheets. Paint film is not disintegrated and no residue is left on the surface. Costly hand scrubbing is eliminated and the surface is left clean for the next operation, making this stripper effective and economical to use.

"Flexible" Conveyor Chain

A new conveyor chain has been developed and produced by the Leeds Electric & Mfg. Co., of Hartford, Conn. Called Multi-Plane chain, it may be bent on the horizontal plane as much as 45° to the reverse of the direction of travel on either side. Designed especially for use with Leeds overhead conveyors and infra-red systems, also for degreasing operations and oven work where greased chains are not practical, it has been found adaptable for innumerable other type conveyors where small radius curves are desirable and sharp bends on different planes follow each other.

"Metalast" System of Painting

The C. A. Woolsey Paint & Color Co., Inc., 229 E. 42nd St., New York 17, N. Y., pioneers in marine finishes since 1853, has developed and is now marketing new types of protective coatings called the "Metalast" System of Painting. These paints contain new resins and have demonstrated exceptional merit during upwards of two years service in preventing the corrosion of industrial equipment and the corrosion and fouling of ships' bottoms. Strong adhesion to all types of metals, high resistance to abrasion and the extremely impervious properties of the coatings are among the chief attributes of the "Metalast" System.

First, there is the wash coat primer which is applied as a single coat and serves as an anchor for subsequent coatings on metal. Secondly is Metalast anti-corrosive, two or three coats of which may be applied within a few hours, to provide a tough barrier coat with tight inner-coat adhesion and

highly resistant to exterior corrosive elements. Third and last is the Metalast top coat, which varies according to color desired and usage. Aluminum is used for many industrial purposes while Metalast anti-fouling (red) is used for ship bottoms. These coatings all air-dry within 15 to 20 minutes and may be brushed, although they are preferably sprayed. A clean steel surface is the only requirement for surface preparation.

Liquid Coloring Composition

The Hanson-Van Winkle-Munning Co., Matawan, N. J., announces the development of a new liquid coloring composition for coloring nickel, brass, copper, aluminum and zinc die castings. The product is known as Acme Grade 4-L-10. It cleans up beautifully on the work; it leaves the face of the buff soft and clear and it does not clog fluid lines. Acme 4-L-10 is recommended for use with pressure type composition spray equipment.

New Liquid Plastic Coating

Lockrey Plastic Products Co., Flushing, N. Y., announces a 100% phenolic resin coating material that can be cured without heat or pressure. The new material, called "Phenoplast" can be brushed or sprayed on practically any surface, and sets within a few hours to form an insoluble, infusible coating of high-gloss transparent phenolic resin which is waterproof, fireproof, solvent-proof and chemical-proof.

Phenoplast is not a "plastic paint", but a 100% phenolic resin in liquid form. It does not "dry" like paint, but "sets" or polymerizes on the work. Chemically it is

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SPRA-KLEEN keeps nozzles, circulating lines and reservoirs free from over-spray sludge.
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practically the same composition as a sheet of cast Bakelite, Catalin or Marblette, the major difference being that it can be applied in coatings of a few thousandths of an inch thickness, and that it is cold-setting and sets with the same high hard gloss that is found on the "flash" end of cast phenolic resins, without any polishing.

Throw-away Paint Cups Used in New Setup

The new Bradford inner-lock paint-spray system includes a cup cover which can be attached to any suction-type paint spray gun. Disposable paint cups (for different colors and materials) can be quickly attached to and detached from a single metal cup cover, as shown in the accompanying illustration.

The inner-lock paint spray system is economical and useful in any factory or shop where spray painting, retouching or touch-up work must be done either regularly or at infrequent intervals.

At the flick of the thumb lever,

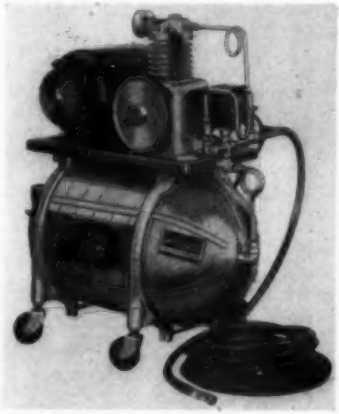
Disposable container fits metal head which can be attached to spray gun.

the patented inner-locking device firmly locks the head to the disposable rigid metal-bottom paper paint cup for use in a moment. This method permits rapid change-over from one color paint to another, since one paint cup can be detached and another locked to the head in an instant. Inner-lock, self-sealing lids protect the paint cups when not in use, and preserve carefully mixed matched colors.

For detailed information on the inner-locking spray head, lids and cups, write Bradford Products Co., 2021 Cass Ave., St. Louis 6, Mo.

Portable Compressor and Spray Outfit

The Electric Sprayit Co., Sheboygan, Wisc., has introduced a compact but efficient tank compressor, Model 3150, which can be moved about wherever it is needed. A balanced ½-h.p. piston-type



When used for spray painting and finishing, an air line assembly with spray gun and quart container is furnished.

Quickly Accurately MEASURES POTENTIAL WEAR RESISTANCE

The TABER ABRASER is easy to operate ... *gives a permanent, accurate rating*

It enables you to determine in advance the inherent surface wearability of paints, lacquers, plating, textile, leather, rubber, metals and many other materials.

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And you can reduce your floor-cleaning costs with Wyandotte F-100*. Even heavy soil stands no chance against this remarkable compound.

For more information about these Wyandotte Products, write the Wyandotte Chemicals Corporation, Wyandotte, Michigan.

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Paint Preparer for ZINC SURFACES

It chemically prepares Zinc, Galvanized Iron, Zinc Base Alloys and Cadmium-Plated Surfaces, producing a hard, etched surface that creates a perfect bond between metal and paint. Galvaprep produces in a few minutes a paint-receptive oxidized surface equal to months of weathering, making possible painting immediately after using.

Don't Use Old-Fashioned Methods

Galvaprep offers the up-to-date superior method that is far more effective than the old-fashioned use of vinegar. It removes or neutralizes all corrosive agents which cause eventual breakdown of the paint-finish. It is especially recommended for metal specialities, signs, die castings, furnaces, venetian blinds, etc.

Write for Bulletin 47-68

NEILSON Chemical Company

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Australian Representative:
HARDIE TRADING LIMITED, Melbourne

compressor, cushion mounted on a 12-gallon stainless steel tank and equipped with casters, pressure gauge, outlet drain, safety valve, hose, air chuck and an automatic starting and stopping switch maintains a constant air supply at between 120 to 150-lbs.

Black Arrow Flock Gun

The Black Mfg. Co., Baltimore, Md., announces a newly developed flock gun. This new addition to the Black Arrow line of "Hollow Air" paint spray equipment will be known as the Black Arrow "Fibr-gun".

The "Fibr-Gun" can be used for the application of all kinds and

Sprays flock uniformly, economically.

types of flock. The manufacturer states that the "Fibr-Gun" handles flock from the very finest up to more than 3/16-in. in length without clogging. A "sensitized" control setup permits the user to quickly vary the flow of flock from the very finest narrow stream to one that is wide and highly concentrated.

This new gun sprays flock uniformly with sufficient embedment under any conditions. Material waste is reduced to a minimum because the gun places flock exactly where desired, in proper quantity.

Sillo Parts Cleaner

The new Sillo Parts Cleaner removes carbon, greases, dirt deposits and petroleum binders from all metal surfaces. It is quick-acting, easy to use, and outstanding in efficiency.

Sillo Parts Cleaner is of the cold immersion type; a single-phase material, that is, it contains no aqueous ingredients; can be brushed, pumped or sprayed; is non-corrosive, non-volatile, non-inflammable and non-aqueous. A product of Petroleum Solvents Co., 331 Madison Ave., New York 17.

New Colorful Booklet Shows Effects of Bad Lighting

The new "Rainy Night" booklet, just released by The Edwin F. Guth Co., emphasizes the importance and value of good lighting by pointing up the effects of bad lighting. It defines the symptoms and describes the hazards of bad lighting. This attractive, full-color booklet contrasts the detrimental effects of poor lighting with the benefits of good lighting in a way everyone will quickly understand. Free copies are available upon request.

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Booklets Catalogs Circulars

Catalog of Rubber Mats

A new 8-page catalog section on its lines of rubber mats and matting has just been issued by The B. F. Goodrich Co., Akron, Ohio. Copies are available upon request.

Rubber-Base Paint Available

Parlon, Hercules Powder Co.'s chlorinated rubber-base for concrete paints and other protective coatings, is now available. This quick-dry, film-forming thermoplastic won acceptance from protective coatings manufacturers when it was introduced in 1935.

Improved Pickling of Iron and Steel

How certain specialized acid inhibitors and neutralizing materials help to lower costs and improve quality in the pickling of iron and steel, is the subject of a special, illustrated Service Report published by Oakite Products, Inc., 32F Thames St., New York 6, N. Y. This Service Report provides valuable data on pickle control materials used in the pickling of high and low carbon and alloy steel.

Inspecting Incoming Material

A new 4-page folder under the above title, is available gratis from North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

The folder suggests procedures that may be followed from the time material arrives in a plant until it is finally accepted or rejected. Also presented, are some requirements covering a typical inspector training course.

A number of standard forms needed in this phase of quality control work are illustrated. The information in the folder should be of value to those charged with the responsibility of putting quality control techniques into service.

New Catalog on "Lithcote"

A new brochure on protective coating and lining for steel and other metals, is now available from Lithgow Corp., 333 W. 40th Place, Chicago 9, Ill.

Lithcote baked-on synthetic resin coatings and linings, are known for their remarkable staying qualities against acids, solvents, brines, alcohols, fats, oils, syrups, petroleum, etc. Lithcote is used on practically any type of processing, storage or transportation equipment, especially in pharmaceutical, food, paper and pulp, and chemical industries.

Stop Fires; Save Jobs

To assist business and industry in reducing the increasing number of fires that last year destroyed more than a quarter of a billion dollars worth of factories, plants and stores, killing hundreds of workers, the National Board of Fire Underwriters has published a 16-page booklet, "Stop Fire—Save Jobs."

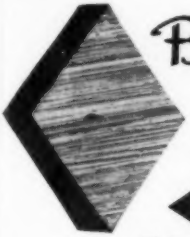
Designed to help management and labor cooperate in a sound program of fire prevention, the booklet points out that industrial fires also cause losses in unemployment, lost production and business failures two or three times greater than the dollar property loss. The booklet tells how to detect and remove hazards that are common to most industries and shows how to eliminate special hazards found in many businesses.

The booklet also seeks to inform employees about the basic elements of fire protection, so they will recognize the operation and importance of sprinkler systems, fire extinguishers, automatic alarms, fire doors, exit drills and other safeguards.

Panic prevention and first aid, which are necessary in reducing the death toll from fire in industry, are outlined in the booklet.

Copies of the booklet may be obtained free from the National Board of Fire Underwriters, 85 John St., New York 7, N. Y.

Better Finishes WITH DIAMOND



FROM LEFT TO RIGHT IN 15 MINUTES*

This is the record of a plastic die mold manufacturer finishing oil hardened die formerly taking 1½ hrs.

STEEL — CARBIDES — SAPPHIRE
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*** fotomicrograf at 25X**

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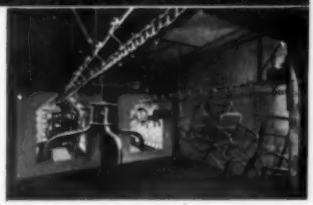
HOW TO SOLVE YOUR PROBLEM of Paint Baking *Irregular Shapes*

PROFIT BY EXPERIENCE OF STURGIS POSTURE CHAIR CO.

Faced with the problem of paint baking steel chairs . . . *involving masses of open spaces* . . . Sturgis called in Jensen. Solving the problem was simple, thanks to Jensen "dual heat." Exclusive Jensen "dual heat" is an efficient combination of both radiant energy heat and convection heat. Only by means of Jensen "dual heat" is it possible to bake . . . *quickly and properly* . . . irregular shapes with masses of open spaces such as these chairs have.

Without cost or obligation we will run laboratory tests on your products, using your finishes. All parts will be returned for your inspection. *Act today!*



Shapes including solid bases, tubular frames, tubular bases and angular frames are all baked with equal efficiency. Oven is U shaped, due to limited space.

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Industrial FINISHING

Distributed Monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Paid for But Losing Every Day?

New machines, tools, devices and materials can fool you. You are attracted and prompted to invest in something new—perhaps by an advertisement, sales talk or demonstration. It looks good; the manufacturer is reliable; it's performance makes it desirable in any one of several ways; you buy it and turn it over to the proper department to use; then perhaps you forget it—if not immediately, soon afterward.

Often—not always, but often—if you will check into that improved equipment six months or a year later you will find that its full advantages and possibilities are not being utilized by those who are entrusted with its care and operation. In other words you have paid for something but you are not getting anywhere near full value out of it.

Let us assume, of course, that the machine or whatever you have bought is put out by a reliable concern. It isn't a "phoney" but its performance is not up to what you were led to believe. You may not know it and those who are using it may not care. Maybe you have forgotten what all it is supposed to do.

Whether or not you believe your new machine or tool or equipment is performing satisfactorily, it is an excellent plan to call in one of the maker's representatives—preferably a technical man—once or twice a year for a careful check-up. Let him observe how the equipment is being used and let him talk to your foreman, operator and maintenance man. If the equipment is being used improperly, inefficiently or in an unsafe way, or if it isn't giving the service it could produce, then this company representative will quickly discover it and report to you accordingly.

Perhaps some vital part or attachment is missing or not functioning correctly and, as a result, you are not getting full value in the way of performance. No equipment is fool-proof. You have your automobile tuned up from time to time to give that perfectly smooth

performance that every motorist likes. All of the machinery and tools used in your factory need a periodic cleaning up, checking up and tuning up too. Otherwise you are being cheated because you are not getting what you have paid for.

Trained Representatives, Salesmen and Dealers

More manufacturing concerns have developed and put into service thorough training courses for the men who represent them in the capacity of salesmen, engineers, service men and dealers. These representatives are trained not only on how to meet and deal with important key men in other industries, but they are given practical and technical information about the various manufacturing processes and methods in which their products will fit effectively and economically. This latter is vitally essential to both the maker and the user of any industrial product.

When a product that is new or improved or different is brought to the attention of a prospective user, it is tremendously important that he be given a clean cut explanation of its merits and how it can serve his organization better than something now in use. He is not impressed with general statements and claims. He demands something specific. He will more or less judge the product and its merits by the man who contacts him and by that man's clear and thorough knowledge of why the product can be used, where and when it can be used, and how it can be used. Ready knowledge of the product's merits, possibilities and limitations are vital.

Furthermore the success of an industrial sale isn't complete when

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This new M.S.A. Respirator provides respiratory safety for industrial finishers against harmful paint spray vapors, degreasing solvents, paint removers, etc. New floating cushion facepiece assures easy comfort; flat exhalation valve lessens breathing resistance; chemical cartridges are quickly replaceable. Write for details!

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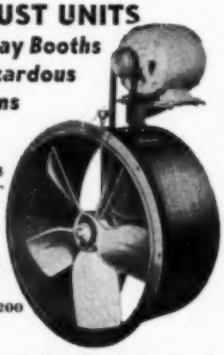

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a product is purchased and placed in service. That product's performance must be satisfactory in every respect. It must be backed up by a manufacturer's or dealer's service that is intelligent, courteous, practical and reasonably prompt. The attitude, "You bought it, it's your baby now," has no place in the dealings among reputable concerns and reputable people.

Finishing Rooms Clean, Bright, Safe, Sanitary

★ Good housekeeping in a finishing department should be considered a necessity. Accumulations of soiled milk bottles, old paint cans, dusty oil cans and dirty uncovered grease cans are not conducive to clean work on the production line. Constant neglect of cleanliness is also a great contributor to fire hazards. The personnel that allows dirt and messy conditions to prevail in the department will be negligent about properly disposing of accumulations that are a fire hazard.

As long as you are running a finishing department, it might be well to look into the color scheme of the shop surroundings. If your spray room equipment is dull, drab and lifeless, how can you expect to inspire your employees to turn out finished products that are of rich quality and enhanced with glamour and saleability?

The spray booths or conveyor system should be given an attrac-

★ Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

Mac's FASHION
NON WIPING & UNIFORMING OIL STAINS

Applied by spraying, brushing or dipping—require no wiping—allow five hours to dry.

Made in all shades of Mahogany, Walnut, Oak and Maple, and for use on all kinds of wood.

Can be reduced with MAC'S STAIN SOLVENT or MAC'S TURPS-NO if lighter shades are desired.

Write for samples and new descriptive folder just off press.

The Lawrence-McFadden Co.

Headquarters for Fine Finishes Since 1875

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tive coat of paint. This has a good effect on all workmen who, in turn, seeing the good housekeeping practiced by management, will endeavor to contribute their efforts toward maintaining clean surroundings.

Oil cans and grease containers are vital to continuous production. Their contents, used properly, can save any firm a considerable sum of money, but when the lubricant containers are covered with dust and are not visible, men on the job tend to neglect using them. It would be a good idea to place the lubricating mediums on a rack painted an attractive color. Containers for oil and grease likewise should be painted or polished for easier visibility.

You paint your product in assorted shades and tones. For what? For sales appeal, of course, as well as for the protective properties of the materials used. Why not sell your employees on the value of protective materials for equipment in attractive colors? The expense will be negligent when when the overall picture of an attractive department with increased efficiency is obtained. When you have visitors or buyers, your clean attractive factory will be noticed by them. It impresses visitors with the fact that the management is not only neat and clean in its merchandise products, but is also neat and clean in the process of manufacturing its wares.

In the long run, the cost of keeping your floors swept regularly, your used empty cans dumped out, the excess spray materials disposed of, the sandpaper dumped out of the waste containers and your finishing department in neat order is a good investment in many ways.

Then look at the condition of your floors. Have they been properly maintained? Are there ruts in them which will cause some load of merchandise or paint to tip over and cause injury or damage

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Any type of stencil screen including fine photographic, made to your sketch, blueprint or specifications.
For the printing or decorating of radio dials, indicators, charts, name plates, metal specialties, toys, games, advertising display, novelties, glass and plastic specialties, furniture, textiles, etc. with lacquers, flat oil colors, enamels, dyes and ceramic.
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to the contents? The time to look into your department and get to work on it is now. Make it neat, clean, and safe for your investment and for your employees.—NORMAN ABRAMOVICE.

How to Get Along With Your Workers

★ Skilled observers who have kept sensitive fingers on the pulse of our industrial democracy warn that steps must be taken quickly and intelligently to improve human relationships in industry. If their warnings are not understood and heeded, strikes will increase both in number and intensity, production cannot be maintained, and those peddling collectivist and authoritarian ideologies will find more fertile ground upon which to sow their destructive seed.

The rapidly developing science of understanding and controlling factors which improve or impair the relationships of individuals and groups is sometimes referred to as "human engineering." This is a term that can be appreciated by men in industry who deal with human problems.

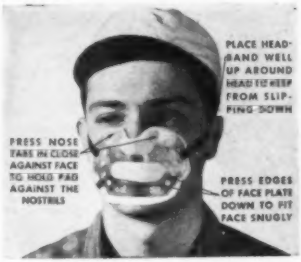
A scientific approach to problems of industrial relations has a definite dollars and cents value. Controlling some of the factors involved is solving a large number and variety of problems for management. The more common ones are: decreasing absenteeism, increasing productivity per man hour, developing pride in workmanship, improving company spirit and loyalty, and preventing strikes.

In too many cases the lines of communication between the carpeted sanctum and the shop are in bad order. The men in both domains must learn to live to-

SEND $1.25 FOR ONE MARTINDALE PROTECTIVE MASK and 50 No. 1 Refills

or $1.50 if you prefer No. 2 Refills

Weigh Less Than ½ oz.


PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

Not Recommended for Toxic Dusts or Free Silica

Protect your nose and throat from dust, powder and spray from non-toxic enamels and paints. Dust may carry dangerous germs.

List Prices—F.O.B. Cleveland

Masks ..... $0.25 each
No. 1 Refills (std. weight) ..... .02 each
No. 2 Refills (heavyweight) ..... .02½ each

Masks packed in individual envelopes. Refills packed in envelopes of 25.

The No. 2 Refills contain twice as much filtering cotton as the No. 1.

Write for Bulletin 352 showing quantity discounts on orders of $5.00 and over

If payment accompanies order we will pay parcel post or express charges. Minimum order for C.O.D. or charge account $2.00.

Martindale Electric Co.
1353 HIRD AVE. CLEVELAND 7, O.

USE
Crystal
TACK RAG
BEFORE YOU SPRAY
Industrial size 18 x 36
WILL NOT SMOKE NOR GENERATE HEAT WHEN STORED IN A WARM PLACE
Always Soft and Tacky

Speed Up Your FINISHING PRODUCTION LINE with this Soft Tacky Cloth

BCP TACKY WIPERS

Available in GROSS LOTS thru PAINT DEALERS or from the Processor

Exclusively Processed by
Baughn Chemical Products Co.
7024 North Ravenswood Avenue
CHICAGO 26, ILL.

MIRACLE
5 Gallon
BLUE
BOY
Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion proof electrical equipment if desired. Also other units from ½-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating Equipment—ten years—thousands of satisfied users.

Miracle Paint Rejuvenator Co.
127 E. 7TH STREET ST. PAUL, MINN.

gether with tolerance. The lines of communication must be put in order and kept clear.

All men are motivated to action by two factors: intelligence and emotion. Conduct of the vast majority springs largely from emotional thinking. It is, therefore, necessary to inject a great deal of enthusiasm coupled with simple logic into every human relations program, if it is to gain popular support. Enthusiasm is contagious, especially among individuals who react largely from their emotions. Thus, proper efforts will usually be rewarded with the development of the capacity for enthusiasm among workers and executive employees.

Teaching people to be emotionally stable and mature is a long, hard process—and virtually impossible in many cases. But skilled human engineering technicians have developed techniques and avenues of communication that are working wonders in many enterprises. They have learned to utilize the benefits of such media of expression as plant bulletin boards, employee publications, visual aids, public address systems, ordinary letters, and hundreds of other ways of reaching individuals and groups.

There is enormous potential power in properly-organized, skillfully-executed industrial and human relations programs. They must be carried out by personnel or agencies who understand the techniques.—The Tool Engineer.

Luminescent Applications

Many useful luminescent applications—for safety aids, toys, games, novelties, displays, decoration, etc.—are described and illustrated in a little booklet published by New Jersey Zinc Sales Co., 160 Front St., New York 7, N. Y. Fluorescent glows during exposure to "black" light. Phosphorescent glows in the dark after exposure to sunlight or artificial light.

POTTER PAINT CO., INC.
CORTLAND • NEW YORK
IMPROVED LACQUER THINNERS AND SYNTHETIC REDUCERS
Our Specialization Can Save You Money
WRITE TODAY FOR FREE SAMPLES
BETTER FLOW GLOSS AND BLUSH RESISTANCE
THINNER SPECIALISTS

Random Comment on the Industrial Scene

(Continued from page 11)

nitric, phosphoric and sulphuric acids and other strong chemicals.

Stainless steel powder is available in either dry flake form or paste; the recommended mixture is one pound to the gallon of lacquer.

In a recent test, fan blades used to exhaust nitric acid fumes were coated with stainless steel paint. They lasted more than 24 weeks, whereas lead-base materials will stand up under these fumes only two weeks. S. S. paint is also said to be suitable for decorative work, signs, etc., where corrosion resistant qualities are important.

* * *

New Kind of Paint. A revolutionary new paint, made from a water dispersion of a synthetic resin instead of customory drying oils, dries in less than half an hour without odor, yet possesses the durability and finish of high class oil paints, according to a joint announcement made recently by Cyril S. Kimball, vice president of the New York chemical consulting firm of Foster D. Snell, Inc., and George O. Morrison, Technical Director of Shawinigan Products Corp., resin manufacturers, New York. The new product is designated by the trade-mark "Gelva" paint.

The pigment and poly-vinyl resin are dispersed in water with 1% or so of a synthetic wetting agent. The product can be brushed or sprayed on in the same manner as an ordinary paint. The applied paint dries in less than half an hour to yield a hard film. The brief drying process from the user's point of view is the rapid conversion of a liquid dispersion by the evaporation of water into a continuous solid film.

"Gelva" paint can be applied to the natural surfaces of wood, metal, brick, plaster, and wallboard, or to surfaces previously coated with oil paint. It has been made in

BLANCHIT
(Trade-Mark Reg.)
U. S. and Foreign Patents
WOOD BLEACH
Accepted Standard
For Furniture and Cabinet Makers
Also Interior Woodwork Recoloring
L. R. van Allen Co.
Patent Licensee
CHICAGO 54

BLEACHES
Decolorant-Color Dissolvent
Aspen Concentrate
Write for information and quotations.
H. BEHLEN & BRO., Inc., 10 Christopher St., New York 14, N. Y.

a full range of colors and tints from dense black through the usual range of deep colors and pastel tints to pure white. Complete freedom from volatile and flammable solvents of "Gelva" paint entirely avoids any odors, fire hazards and possible reactions of persons to vapors.

Classified Advertising

Rate: 50 cents per line per insertion—minimum $1.50

SALESMAN WANTED.

Wood finishing material salesman wanted by a Southern firm to represent it in a Southern territory. The territory is now producing a good volume of business so this is an excellent opportunity for a man with good sales ability, pleasing personality and experience in the sale and application of wood finishing products. In reply, please state age, experience, family status and name of present employer, if any. Our employees know of this ad. Address IF-451, care Industrial Finishing.

RESEARCH & PATENTS.

Matured executive, chemical engineer and patent attorney, over 20 years' experience in organic coatings for metal, wood and textiles, seeks position with reputable and progressive organization as director or coordinator of research and patent work. Now located in southern Indiana. Available promptly. Address IF-392, care Industrial Finishing.

FOR ALL FINE FINISHES
TAC-ALL
TACK RAGS
Packed bulk or individually.
Prices and samples on request.
GEO. W. RENNER CO.
2309 Lillie St., Ft. Wayne 5, Ind.

POSITION WANTED.

Finishing room foreman with 20 years' experience in wood and metal finishes desires position with a well rated firm. Address IF-450, care Industrial Finishing.

SALES POSITION WANTED

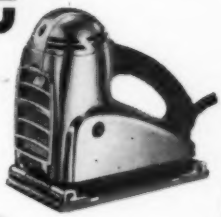
With manufacturer of complete line industrial finishes. Commission basis. Territory Metropolitan New York and suburbs. Have large following, also knowledge of materials and application. Address IF-449, care Industrial Finishing.

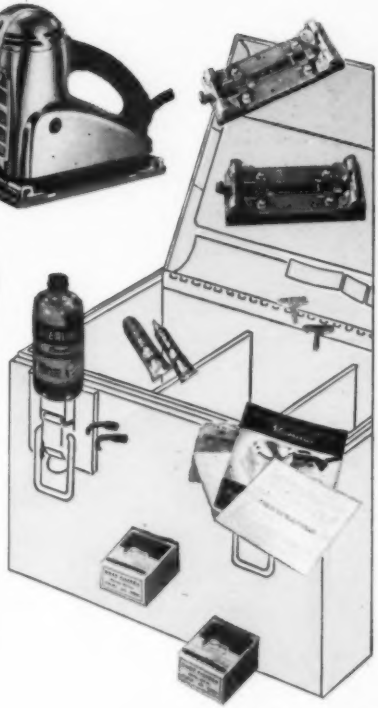
PICTURE FRAME MOULDING FINISHER.

We desire the permanent services of a well educated man with broad experience in picture frame molding finishing or related industry. Preferably man with chemical background and artistic taste that can get production in good finishes and that has artistic taste toward creating new finishes, etc. GEORGIA ART SUPPLY CO., 280 Garnett St., S. W., Atlanta, Georgia.

Complete Sander Kit

NEW ABRASIVE SELECTOR





Everything You Need On the Job!

All steel case contains Sterling Portable Electric Sander (for fast, economical finishing), extra sanding pads, oil, grease, filters—complete, everything needed on the job. New slide rule abrasive selector with answers to hundreds of finishing problems in each kit.

Case provides safe storage, saves time, and keeps all material together in one place. Descriptive folder gives all details on Sander operation and kit.

Convenient and easy to carry.

—————SEND COUPON FOR FOLDER!—————

STERLING TOOL PRODUCTS CO., 345-J EAST OHIO STREET, CHICAGO 11, ILLINOIS

NAME_____

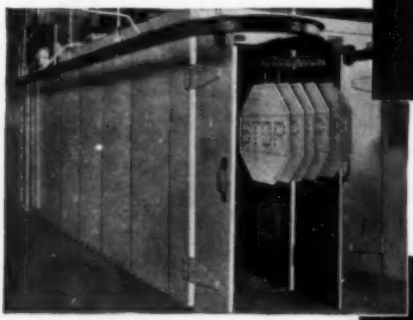
ADDRESS_____

CITY_____ ZONE____ STATE_____

STERLING PORTABLE ELECTRIC SANDERS

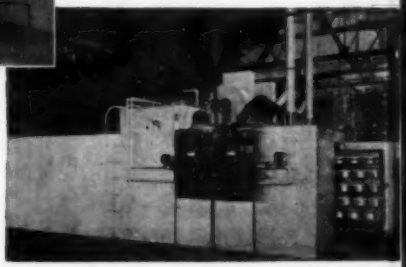
GOT A HOT OVEN PROBLEM?

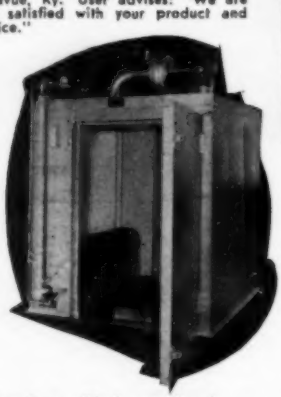
Consult KIRK AND BLUM



Monorail Conveyor Type paint baking oven, installed at Grote Mfg. Co., Bellevue, Ky. User advises: "We are well satisfied with your product and service."

Safety Assured: every Kirk & Blum oven is equipped with the highest quality, latest design safety equipment and automatic temperature controls.





Drying is a critical operation in production . . . Kirk & Blum engineers designed this oven which increases heat gradually giving best results.

From mammoth conveyor ovens to small laboratory units, Kirk & Blum builds many types of industrial ovens for a multitude of uses. All incorporate the latest safety devices and temperature controls to meet production, state and insurance requirements.

From more than 40 years of experience in this special field, Kirk & Blum Engineers can quickly determine the oven that meets your needs. Write for Catalog O, "Industrial Ovens", showing installation views in various types of plants. The Kirk & Blum Mfg. Co., 2831 Spring Grove Ave., Cincinnati 25, Ohio.

An Organization of Engineers and Mechanics

KIRK AND BLUM
FUME CONTROL